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ANALYSIS OF THE DYNAMICS OF THE FORMAL SECTOR EMPLOYMENT MARKET IN GUINEAN AGRICULTURE

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Executive summary

Youth employment, and especially for higher education graduates, remains a major challenge in Africa, but increasingly so globally. The financial crisis of 2007-08 and its aftermath effects on economic growth brought to the fore the structural disequilibirums from which many countries suffer. In Africa, and despite the gains in recent decades in terms of accelerated economic growth, it appears that the distribution of the growth gains did not reach across all social groups. This is especially true for African youth which represents the dominant demographic in the continent. Indeed, the rate at which the economy adds new job opportunities for youth cannot match the youth bulge characterizing many of the countries within the continent. Hence, potential higher economic growth is not achieved due to wastage of human capital.

One of the major obstacles facing policy-makers efforts to enhance youth participation in the economy is the lack of systematic analysis of the dynamics of labor markets in the region. Indeed, many studies have elucidated the imbalances between the supply of education and the needs of the labor market (WB, 2008; UNCTAD, 2013). In this sense, Guinea is no exception, despite the best efforts of the government in recent years. It is in this context that the Agricultural Education and Market Improvement Program (AEMIP), led by Winrockwith funding from the United States Agency for International Development (USAID) and in collaboration with Purdue University, and the Ministries responsible for university and technical school education in Guinea aims to analyze the dynamics of the formal labor market in agriculture in Guinea. The main objective of the study is to elucidate the employment status of recent graduates from the agricultural training institutions, analyze job categories to highlight trends in terms of the needs of the agricultural job market, etc.

In this context, the first stage of the project focuses on data collection from the agricultural education and training institutions in Guinea. These are the Institute of Agricultural

and Veterinary Sciences (ISAV) in Faranah, the National Schools for Agriculture and Livestock (ENAEs) in Tolo, Kankan, Bordo and Macenta, and the National School for the Water and Forestry (ENATEF) in Mamou. In a second step, a survey of data from historical and potential employers is conducted to understand the needs of the agricultural job market.

Globally, the employment rate of graduates in the survey in Guinea in the formal job market is 33% for ISAV, 26% for ENATEF and 14% for the all the ENAEs combined. With respect to the latter, the disaggregated employment rates for each ENAE are: Tolo, 7%; Macenta, 12%; Koba, 13%; and Kankan, 24%. Additionally, the survey data provides estimates of the employment rates of graduates from the technical institutes in the informal sector: Tolo, 9%; Macenta, 5%; Koba, 1%; and Kankan, 3%.

When we investigate the employment dynamics at the sectoral level, we observe that the private sector is the main provider of jobs for the graduates in the survey (Table 1). Indeed, 66% of graduates from ISAV in Faranah are employed in the private sector. This proportion is 65% for the graduates of ENATEF and 56% for the graduates of the ENAE. Within the ENAE, the share of graduates employed in the private sector can be upwards of 70% for the ENAE in Macenta. For the public sector and self-employment categories, we observe that there exist substantial variations. For instance, the share of graduates employed in the public sector varies from 0% in the ENAE in Tolo to 28% in the ENAEs in Kankan and Koba. Self-employment is an important source of jobs for graduates, but with great variation across institutions. For instance, 11% of graduates of ENAE of Kankan are self-employed; whereas this proportion reaches 63% in the ENAE of Tolo. It is worth mentioning that for the ENAE of Tolo, the high share of self-employed among the graduate is in part due to the fact that an important share of graduates use the school's farm plots as a start-up for their agricultural business.

Table 1: Employment of graduates by school and by category in the formal sector

School	Sector		
	Public	Private	Self-employment
ENAE	20%	56%	24%
— Kankan	28%	61%	11%
— Koba	28%	50%	22%
— Macenta	10%	70%	20%
— Tolo	0%	38%	63%
ENATEF	15%	65%	20%
ISAV	21%	66%	13%

Source: Telephone surveysof ISAV, ENAE and ENATEF

Now turning to the analysis of employment trends of female graduates, we observe that globally the formal sector employs 24% of female graduates from ISAV, 30% from ENATEF and 11% from the ENAEs. Within the latter, the employment rates for each ENAE are as follows: 9% in Tolo, 17% in Koba, and 20% in Kankan. In terms of employment in the informal sector, we notice that 6% of female graduates from Tolo are employed within the informal sector and 5% for Kankan.

At the sectoral level, the private sector remains the main provider of jobs for female graduates (Table 2). Yet, there exists substantial differentials in the dynamics of employment for the female graduates compared to the general pool of graduates in the survey data. For example, the female graduates are rarely self-employed. In terms of the distribution of employed female graduates in the private sector by school, we notice that the latter employs 58% of the female graduates of ISAV, 73% from the ENAEs and 100% from the ENATEF. Within the ENAEs, we observe that the private sector employs 50% of female graduates from Kankan, 80% from Koba, 0% from Macenta and 100% from Tolo. The main reason for the lack of employment for women graduates from Macenta appears to be that 20 of the 23 of the Macenta women in the sample are from the 2013 graduating class and the rest are from the 2012 cohort. The data indicates that for all the schools it often requires several years for graduates to find formal sector jobs. Consequently, it is not surprising that 2013 Macenta women graduates are unemployed.

Table 2: Employment of female graduates by school and by categorie in the formal sector

School	Sector		
	Public	Private	Self-employment
ENAE	27%	73%	0%
— Kankan	50%	50%	0%
— Koba	20%	80%	0%
— Tolo	0%	100%	0%
— Macenta	0%	0%	0%
ENATEF	0%	100%	0%
ISAV	38%	58%	4%

Source: Telephone surveys of ISAV, ENAE and ENATEF

In the employer interviews, the objective was to assess the current and future need for staff by the employers, and evaluate the strenghts and weaknesses of the graduates. In terms of

the projections for future hiring by the employers in the short (5 years), medium (10 years) and long (20 years) terms, the majority of employers expressed reservations in providing estimates. Nevertheless, and after discussions with the employers, a majority agreed to provide estimates for potential hiring within the next five years. It follows from the results of the survey that the number of employees is projected to double. But, there exists substantial regional differentiation.

In terms of employees' profiles that are most desired by the employers, the majority expressed a desire to hire university graduates and technicians, especially in areas related to livestock, agricultural machinery, rural economics, etc. Among the skills most desired, a majority of employers express a special interest in graduates with strong mastery of technical packages, oral and written communication, and willingness to live and work in rural areas. The employers frequently express a need for skills directly applicable to business.

When evaluating the performance of graduates from ISAV and the ENAE, a common point over which the majority of employers agree is the lack of practical knowledge (87%). Additionally, many employers denounce the poor level of the graduates' writing skills (69%), oral and written communication skills (46%), and computer skills (37%). With respect to mastery of theory and team work, 27% and 13% respectively of employers express dissatisfaction. Nevertheless, there exists a major contrast between the graduates of ISAV and ENAE. Many employers report that in terms of mastery of theoretical knowledge, the ISAV graduates exhibit in general a superior level compared with the ENAE graduates; and vice-versa with respect to the practical knowledge where the ENAE graduates are thought to be superior to their peers from ISAV. Additionally, many employers deplore the fact that ISAV graduates are often unwilling to relocate to rural areas. ENAE graduates are frequently more willing to work in rural areas.

At the level of collaboration with the education schools, a majority of employers deplore the lack of official documents and protocols of partnerships. Indeed, 43% of employers report not having any sort of written agreement with ISAV and the ENAE. Others mention the existence of such conventions and/or protocols, but with no-active implementation (24%), and/or they note that they are informal (31%). Additionally, many employers deplore the lack of organizing symposia and open-door events to inform students of internships and/or employment opportunities (21%), research workshops (14%), partnerships in terms of course preparation and teaching (9%), and consultation on research themes for student's theses (7%).

Recommendations for the agricultural higher education institutes - On the basis of the low level of formal sector employment of graduates, future demand for staff by employers, and the econometric analysis of the survey data, it is possible to propose the following recommendations:

- Enhance understanding and mastery of the agricultural technical packages. Given the fact that employers require skills specific to their field of operation and institutional budget constraints, the most practical option is to focus on internship programs. Despite the availability of farm plots at the schools, they remain underequipped and the equipment they have is obsolete in comparison with the technologies used by the employers in the private sector in Guinea. In this regard, internships ought to be longer with active supervision from the internships' supervisors.
- To close the gaps in terms of communication skills, there is need to incorporate more instruction in oral and written communication through intensification of written assignments and in-class presentations. In addition, written communication instruction ought to introduce the professional dimension through training in producing written reports similar to technical summary notes encountered on the job. Also, in-class presentations ought to be done in PowerPoint so as to enhance students' computer abilities.
- Add and enhance instruction in computer skills and computerized equipment (e.g. GPS).
- Improve relations with the employers. Most employers wish to formalize relations with ISAV, the ENAEs and ENATEF, with those relationships solidified with active follow up, including for example:
 - Participation of the employers in the supervision of the internship reports. Employers report a preference for actively participating in the choice of research themes and for being part of the internship oversight committees;
 - The students' advisors need to check on the students while in the field during the internships at least once in order to observe the conditions of work and discuss progress with employers;

- To enhance the students' awareness of internships and help employers in their search for potential candidates for future hiring, the schools need to organize annual job fairs. These events should be a primary source of on-campus networking for the employers and they should be an occasion to facilitate meetings of employers with faculty and students;
- To facilitate contact with the employers, the schools could develop advisory councils or create such a council under the auspices of the Guinean Agricultural Institutional Network (GAIN). The functions of such councils are purely advisory. Its primary objective is the facilitation of the communication between the schools and the employers.
- In order to familiarize, encourage and facilitate the students' integration in the rural regions post-graduation, there is a need to introduce regular field trips throughout the curriculum years in ISAV, ENAEs and ENATEF. Ideally, these trips ought to cover all agricultural regions within Guinea.
- In addition, students need to improve their level of the English language. In certain domains and for particular jobs, English proficiency is a requirement. Introducing English into the schools' curricula can take many forms, each enhancing the other and building on their mutual strengths. For instance, English instruction could be introduced as an extracurricular activity. Additionally, the schools might organize "English Clubs" or other students associations to enhance the students' opportunity to practice English outside the classroom.

All the recommendations here apply to all the institutions, but some are more important for ISAV and some for the technical schools. For example, mastery of practical skills is desirable for all, but essential for technical school graduates. Employers expect ISAV graduates to have better oral and written communication skills than technical school graduates. Knowledge of English is more important for ISAV graduates (especially for those who work with foreigners), than for technical school graduates who work mainly with Guinean clients and co-workers. Improving computer skills of graduates, closer relationships with employers and more experience with rural life are important for all the institutions.

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ACRONYMS

AAPRGF	Association of the Development Specialists for Rice and Pork Production in the Guinea Forest Zone
ADMR	Association for Development in Rural Areas
AEMIP	Agriculture Education and Market Improvement Program
ANAVIG	National Association Poultry Breeders and Producers of Guinea
ANPROCA	National Agency Promoting Rural and Agricultural Consulting
APEK	Association for the Economic Promotion of Kindia
ASDD	Association for Solidarity and Sustainable Development
AVGRN	Association of Volunteers for the Management of Natural Resources
AVOD	Association of Volunteers for Development
BTGR	Technical Bureau of Rural Engineering
CMC	Charente Maritime Cooperation
CNOPG	Guinea National Confederation of Rural Residents' Organizations
CRRAB	Regional Center of Agronomic Research of Bordo
DG	Director General
ECAM3	Third Cameroonian Investigation among Households
ECODEV	Exchange and Co-development
ELIM	Quick Integrated Household Study (l'Enquête Légère Intégrée auprès des Ménages)
ENAE	National Schools for Agriculture and Livestock (École Nationale de l'Agriculture et Elevage)
ENATEF	National School for Forestry Technicians (École Nationale des Agents Techniques des Eaux et Forêts)
ETCO	Earth Moving and Construction Company
FABIK	Agro-Biological Farm of Kondoya
FAPI-Guinea	Federation of Beekeepers of Guinea
FEREPPAH-GF	Regional Federation of Palm Oil and Natural Rubber Producers of Guinea Forest Zone
FOB-BG	Federation of Peasants Organizations of Lower Guinea

FUCPIS	Federation of Cooperative Unions of Producers of Yam and Sesame
FUMA-HG	Federation of Vegetables and Fruits of Upper Guinea
FUPRORIZ-HG	Federation of Rice Producers of Upper Guinea
GAIN	Guinean Agricultural Institutional Network
GPS	Global Positioning System
IEG	Independent Evaluation Group
IRAG	Agricultural Research Institute of Guinea
ISAV	Institute of Agricultural and Veterinary Sciences (or ISAV/F: Institute Supérieur Agronomique et Vétérinaire de Faranah)
IT	Information Technology
LMD	License-Master-Doctorate
NGO	Non-Governmental Organization
OCPH-CARTTAS	Catholic Organization for Promotion of Humanity
RGTA-DI	Guinean Network for Animal Traction and Integrated Development
SARA	Support Structure for Networking of Women Farmers and Farmers
UDIS	Unified Development Indicators Survey
UGVD	Guinean Union of Volunteers for Development
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
VDD	Volunteers for Sustainable Development
WB	World Bank

Introduction

The agricultural sector in Guinea remains the primary source of employment. However, there are major gaps in terms of the analysis of the operating dynamics in the agricultural labor market. In general, 80% of the working population is employed in agriculture. Following the dismantling of the former state-dominated production system during the 1980s, the majority of the employment is available in small and medium informal sector farms. The availability of statistical data on the development of the formal employment market in the agricultural sector is limited, even if these are necessary for rational planning of education and vocational training.

The overall objective of this study is to identify the types of employment available in the formal agricultural sector, and the profiles of technical skills required by the labor market for the two decades to come. In more concrete terms, we have identified the following sub-objectives as the main areas of investigation:

- Determining the employment status of the graduates of higher education institutions in Guinea: What kind of employment do they have? What are the technical skills required? And what are the pathways for improving the educational curriculum at ISAV, at the ENAEs and at ENATEF to better prepare students for the labor market?
- Analyzing the trends of the evolving needs of the formal agricultural employment market in the five, ten and twenty years to come, i.e. estimate the desired number of graduates and their technical profile? What kind of training is required for the development of the desired profiles (e.g. academic, vocational training, etc.)?
- Suggest recommendations obtained from the analysis in terms of improving higher and technical training programs for a better match between the supply and the demand of the graduates' professional profiles.

The results and conclusions of this analysis will be shared with Guinean institutional partners and include the ministries for agricultural education namely: the Ministry of Agriculture, the Ministry of Environment, the Ministry of Higher Education and Scientific Research, and the Ministry of Employment, Technical Education and Vocational Training; the institutes of higher education in agriculture, which include: the Institute of Agricultural and Veterinary Sciences Valéry Giscard d'Estaing at Faranah (ISAV), the National Schools for Agriculture and Livestock (ENAE) at Tolo, Macenta, Kankan, Koba and National School for

Water and Forestry (ENATEF); the students and their families as part of their process of choosing careers, together with the international donor organizations.

1. Literature Review

The problem of employment is a global phenomenon, especially at the level of youth employment in developing countries. The issue of professional integration of young people is not new. However, the financial crisis of 2007-2008 and the level of anemic performance that has followed in terms of economic growth, highlighted gaps in several government initiatives globally in terms of education policy and the professional integration of young graduates. Indeed, the International Labor Organization (ILO) estimated a youth unemployment rate of 12.6% in 2011. In its report, the ILO notes that in general, the issue of employment is exacerbated in developing countries, where half of the young workforce remains unemployed.

The conclusion is the same for the efforts of international organizations. For example, the Independent Evaluation Group (IEG) of the World Bank (WB) concluded that the portfolio of the financial support from the World Bank for youth employment remains relatively limited. The majority of the financial support is focused on initiatives related to professional and vocational training, and the projects to support the transition to the labor market (IEG, 2012). One of the major findings of the report is the lack of recognition of the problem of youth employment in the national development strategies, even in areas where the problem of youth unemployment presents major risks. Indeed, this issue affects all sectors of economic activity, and therefore a multi-sectoral approach is needed to address them. However, in practice, the number of projects that are implemented through a multi-sectoral team work is limited (IEG, 2012).

In addition to the inadequate education and employment policies, the demographic pressure represents one of the major issues facing the implemented efforts. Indeed, the youth population in Africa is rapidly increasing. According to recent studies (Bloom, 2011; Proctor, 2012), the youth population in Sub-Saharan Africa will increase by 42.5 million between 2010 and 2020, and this is even more striking since the age group of under 14 already represents 42% of the population in the region. And thus the pressure exerted by the demographics on the capacity of the the labor market to absorb the youthful population is huge. In the majority of the countries in the region (Guinea included), the creation of employment by the formal sector remains insufficient. Therefore, a large proportion of the youth will continue to work in the

informal sector (Fox and Sohnesen, 2012). The structure of formal employment in Guinea remains dominated by the public sector and formal companies. However, only 12% of the workforce is employed in these sectors (Table 1). The majority of these formal jobs are in the capital Conakry and the regional capitals.

Table 1: Change in employment structure (15 years and above) between 2002 and 2012

Categories of workers	Years								
	2002			2007			2012		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Public salaried/large businesses	18.8	1.1	4.9	13.3	1.0	4.0	16.4	1.4	5.4
Micro-businesses salaried	5.5	0.3	1.4	5.9	0.4	1.8	9.5	1.3	3.5
Employers	1.8	0.8	1.0	1.3	0.4	0.7	2.0	0.8	1.1
Agricultural self-employed	4.8	51.9	41.9	6.4	60.0	46.7	10.0	58.6	45.8
Non-agricultural self-employed	66.1	8.7	20.9	53.2	9.4	20.3	49.5	9.2	19.8
Other dependant workers	2.9	37.2	29.9	20.0	28.7	26.6	12.6	28.7	24.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: IMF, 2013

For this study, the formal sector is defined to include any business and/or organization operating in the agricultural sector that is registered with the Guinean tax authorities, which may include farmers' associations and agricultural cooperatives, agricultural donors and non-governmental organizations (NGOs).

Studies of the dynamics of the labor market in Africa are limited, and are characterized in most cases by descriptive reports. The lack of data in this area limits the ability of researchers to perform in-depth and rigorous analyses. In what follows, we will present an overview of the economic literature concerning the studies and analyses of the labor market dynamics and the integration of youth. We will focus on studies conducted in Africa.

Leibbrandt and Mlasheni (2004) present an analysis of the employment markets in Sub-Saharan Africa, focusing on youth employment. They use a systematic review of the literature on labor markets in Africa and complement it by a review of the international literature. In the international development literature, the focus was mainly on the analysis of the effects of structural change and its impact on the dynamics of human resources transfer between the rural

(mainly agriculture) and urban sector (Lewis, 1954; Harris and Todaro, 1970; Corden and Findlay, 1975). However, the dimension of youth participation in the labor market was absent in most of these studies.

There are several factors that influence the dynamics of youth employment. Urban migration is one of them according to the analysis by Bigsten (1997). The latter suggests that in the context of Sub-Saharan Africa, urban employment represents only a small fraction of the total employment. This conclusion is problematic given the large migration flows from rural to urban areas, and the fact that this migration is projected to increase in the coming decades due to the high rate of urbanization in the region (Harsch, 2001). The dynamics of urban migration, affecting youths more than adults, remains difficult to explain, especially since rural areas often offer more work opportunities than urban areas. Among the hypotheses advanced is that wages in the rural areas remain very low. To this end, Hope (1998) suggests that the very low level of compensation in rural areas pushes the desperate youths to try their luck in urban areas, even if the number of job opportunities are very limited compared to rural areas (Linden, 1996).

The level of education is an important variable affecting the integration prospects of young people in the labor market (Psacharopoulos, 1994). In the African context, and contrary to the findings of Psacharopoulos, Appleton (1999) suggests that the effect of education measured by the yield of education¹ is modest. In their analysis of the link between education and employment in a sample of 15 African countries, Leibbrandt and Mlatsheni conclude that there is no robust relationship between the two. Indeed, the analyzed countries offer contrasting results. For example Kenya, which has a relatively high level of education, exhibits high rates of unemployment; while Nigeria, also benefiting from comparable levels of schooling, shows lower unemployment rates. In a cost-benefit study realized by Knowles and Berman (2003) comparing 41 intervention programs targeting the youth, they conclude that the investment in formal education exhibits the highest returns.

One of the most studied factors in the literature on employment and youth unemployment is related to the size of youth cohorts. Several studies have made the link between the increase in the size of the youth cohort and its adverse effect on the professional integration capacity (Korenman and Neumark, 2000; O'Higgins, 1997; Breen, 2005; Lam, 2006). In his study of the

¹ Mincer (1974) is the pioneer of studies analyzing the yield of education.

evolution of the youth labor market in a sample of developing and emerging countries, O'Higgins (2003) estimated an elasticity of youth unemployment on the relative size of the youth cohort at 0.5. In other words, increasing the cohort of youth by one percent leads to an increase in the rate of youth unemployment by 0.5 percent. Surveys in Ethiopia and Tanzania have presented similar findings (Garcia and Fares, 2006a, 2006b).

More recently, Cissé (2005) analyzes the impact of education on the insertion capacity on the labor market in Senegal. Using data derived from the Unified Development Indicators Survey (Quid, 2001), he demonstrates the positive impact that education has on the probability of the professional integration of youth in the labor market. In the same vein, Boutin (2010) presents an analysis of the factors affecting the transition of youth into the labor market in Cameroon. For this purpose, an econometric model 'Probit' is estimated based on data from the third Cameroonian investigation among household (ECAM3) conducted in 2007. The results of the analysis indicate the existence of large disparities in the School-Work transition in Cameroon. It notes that the probability of employment access is higher for individuals with a primary and/or secondary level of education compared to individuals with no education or with a higher level of education. In addition, individual characteristics such as gender, place of residence, marital status, etc. have a significant impact on the probability of employment.

Doumer and Nordman (2012) contrast the effect of vocational training and general education on the professional integration capacity of youths in urban areas in West Africa. The analysis is performed by estimating a 'logit' model on the collected database as part of the 1-2-3 study conducted between 2001 and 2003 in the capitals of seven countries in West Africa. Their findings suggest that individuals who had access to vocational training opportunities have a comparative advantage in the formal employment marketplace, and demonstrate a higher potential income level compared to the individuals who only had access to a general education.

On another note, Gakou and Kuepie (2008) focus their analysis on the determinants of the integration of women into the labor market in Mali. To this end, their empirical model is based on the results of the Quick Integrated Household Study (ELIM) concluded in 2003. Three explanatory theories are tested. Their findings support the hypothesis of a survival strategy that articulates that women from poor households more frequently find opportunity in the labor market than those from wealthier households. Education is effective in terms of stimulating the participation in the labor market only among women from wealthier households.

Through the review of the economic literature introduced above, it should be noted that the major findings of these studies demonstrate the existence of a positive impact of education on the professional integration of graduates. However, individual characteristics such as gender, marital status, place of residence, etc. may have effects in both directions; i.e. they either positively influence the integration ability of graduates, or they represent an obstacle. In this sense, the individual characteristics themselves are only a reflection of the labor market preferences vis-à-vis certain categories of potential employees.

2. Methodology and data

In this section, we will proceed to the description of the methodology pursued to conduct the analysis for the Guinea case. We'll start by describing the process for primary data collection and their analysis. Given the objectives identified above, the analysis focused on two main axes: 1) the analysis of the factors affecting the professional integration of ISAV, ENAE and ENATEF graduates; and 2) the identification of future needs trends in terms of the number of vacancies and professional qualities required and desired by employers. In what follows, we will discuss in detail the methods used for primary data collection and processing as well as the analysis techniques identified for the two lines of work.

2.1. Phone interviews

For the first axis, it was first a question of collecting data relative to the employment status of ISAV, ENAEs and ENATEF graduates in Guinea. To do this, questionnaires were developed and administered among graduates.

In the case of ISAV, we used data from an investigation conducted in August 2013 by a team of instructors and students at ISAV and with a technical supervision from Purdue University under the AEMIP pilot-project. It should be noted that the ISAV investigation was conducted for an internal evaluation of ISAV before the study on the agricultural labor market had started. Therefore, the ISAV questionnaire was missing two questions that, from experience, seem to be essential: a question about informal employment for graduates having no work in the formal sector, and a question about their level of English proficiency. A representative sample was randomly selected, representing 10% of the 4125 ISAV graduates identified during the past five years. A questionnaire was developed and administered to the graduates included in the

sample via phone calls (Appendix A). Almost 100% of called graduates responded to the interview call.

For the case of ENAE and ENATEF, the same procedure was adopted for the data collection on graduates, except that we did a kind of census of the graduates. We contacted all graduates for whom we have a mobile phone number. We decided to do interviews with all the identified graduates, instead of a sample, due to restricted number of ENAE and ENATEF graduates. In general, the number of graduates in the last five years is around one hundred for each school. A questionnaire was developed and administered via telephone communication with the graduates (Appendix B). The investigation was conducted during the period of July 2014 among graduates from four ENAE: Kankan, Koba, Macenta, and Tolo, and among the ENATEF graduates in Mamou. The percentage of graduates in the selected samples relative to the total number of graduates in the period is as follows: ENAE-Kankan ($96/128 = 75\%$), ENAE-Koba ($137/183 = 75\%$), ENAE-Macenta ($87/151 = 58\%$), ENAE-Tolo ($109/142 = 77\%$), and ENATE-Mamou ($78/95 = 82\%$). Overall, we were able to conduct interviews with 73% of the ENAE and ENATEF graduates in the last five years. In general, every graduate called was willing to speak with interviewers. The lack of access to telephone numbers of certain graduates is the reason for which these could not be contacted.

In a second step, the data collected from questionnaires administered to graduates coming from different agricultural training institutions will form the database used in the estimation of the probit model. This step will allow us to identify the main factors affecting the probability of obtaining employment. The data derived from the telephone survey provides information on a number of indicators identified as having a potential impact on the integration capacity on the labor market such as gender, the institution the student graduated from, specialization, knowledge and technical skills, level of mastery of foreign languages, etc.

2.2. Key informant interviews

For the second axis, a field investigation of historical and potential employers of ISAV, the ENAE, and ENATEF graduates was conducted in different regions of Guinea. Based on a questionnaire developed by the technical supervision team of Purdue University (Appendix C), the data collection was performed based on the face-to-face interviews with the representatives of the identified institutions.

Interviews with employers were conducted in large urban areas in Guinea and include Conakry, N'zérékoré, Kankan, Kindia, Mamou and Labé. Traditional employers of ISAV, the ENAE and ENATEF graduates include:

- governmental departments within the Ministry of Agriculture, Ministry of Higher Education, and Ministry of Employment, Technical Education and Vocational Training,
- higher institutes and of technical training in agriculture, including ISAV and the ENAE,
- the Agricultural Research Institute of Guinea (IRAG),
- primary and secondary schools (public and private),
- private building and civil engineering companies,
- the agricultural livestock operations (mainly poultry farms),
- cooperatives and farmers associations, and
- private farms.

Among the potential employers of ISAV, the ENAE and ENATEF graduates included, we identify mining companies as well as NGOs and community organizations.

2.3. Investigators and investigation period

The main team responsible for conducting of the analysis of agricultural formal sector employment in Guinea consists of:

- Dr. Jess Lowenberg-DeBoer as primary project coordinator;
- Mr. Ismail Ouraich as data analyst and editor of the summary report;
- Mr. Alseny Soumah and Mr. Diawo Diallo as external consultants responsible for the field data collection for the employers interviews;
- The teams of interviewers from higher learning institutions (i.e. ISAV, ENAE and ENATEF) responsible for collecting empirical data through telephone surveys.

It is appropriate to note the following:

- The conduct of telephone interviews took place with the direct participation of students within the institutions as the alumni interviewed, and under the supervision of the teaching staff within said institutions;
- The Guineans consultants responsible for conducting the employers interviews underwent training on ethical principles and guidelines for the protection of human subjects of the in Mamou July 20th, 2014 during Lowenberg-DeBoer's visit to Guinea for the AEMIP Training of Trainers program in Agricultural Research at ISAV;
- The same training was provided to student-investigators from the ENAEs and ENATEF by the two Guineans consultants, with active supervision from Dr. Lowenberg-DeBoer;
- The telephone survey and the discussion guides for the employer interviews were discussed and reviewed with the consultants on July 20th, 2014. The telephone survey was subsequently discussed with the student investigators at each ENAE;
- The student investigators were not paid. However, under the AEMIP project, they were given phone cards and refreshments. During the period of Ramadan, the refreshments were distributed in late afternoon at the end of the student-interviewers fasting period.

2.3.1. Phone surveys interviews of ISAV

For the telephone surveys of ISAV graduates, the latter took place during the month of August 2013. The team in charge of data collection was identified after a work meeting between Dr. Lowenberg-DeBoer and Ms. Rachel Gomez with the Director General (DG) of ISAV. Table 2 shows a summary of the major activities conducted in this regard and identifies the interviewer teams selected.

Table 2: Chronology of the major activities conducted for the telephone survey of ISAV

Date	Performed tasks
Friday, August 9th, 2013	<p>— Identification of the telephone survey working group, and which includes:</p> <ul style="list-style-type: none"> • Students-interviewers numbering 14 students. The latter were all from ISAV Faranah; • The telephone survey supervisors team (4 members from ISAV) and which included: <ul style="list-style-type: none"> ○ Dr. Mamadou Aliou Diallo, Head of the Breeding Department, ○ Dr. Abdoulaye Barry, Head of the Agricultural Department, ○ Dr. Amara Touré, Head of the Agricultural Engineering Department, ○ Emmanuel Samako Tolno, Researcher/Speaker, Agricultural Economics Department
Saturday, August 10th, 2013	<p>— A meeting at the ISAV director general's office with the telephone surveys work group for discussion of the questionnaire.</p> <p>— The final identified version (Appendix A)</p>
Monday, August 12th, 2013	<p>— The investigation group proceeds to the selection of a representative sample (10% of the ISAV graduates effective during the past five years 4125 – the sample size is of 411 individuals) and launches the telephone survey.</p>
Friday, August 16th, 2013	<p>— Presentation of the preliminary results of the data collection derived from the telephone survey by Dr. Aliou, general supervisor of the investigation team.</p>

Source: AEMIP0008-AET Assignment Report

2.3.2. Phone survey interviews for ENAE and ENATEF and key informant interviews

For the ENAE and ENATEF, telephone surveys were conducted throughout the month of July 2014. These were made following the same organization pattern adopted for the telephone survey of ISAV. In this case, a team of investigators was selected within each ENAE from the student population. The administration of the survey was supervised by instructors within each institution to ensure an effective management of the process.

For the survey of the employers questionnaires, the tasks of administering the questionnaire and collecting the data were performed by two the Guinean consultants, Mr. Alsény Soumah and Mr. Diawo Diallo (Appendix D).

3. Graduates of universities and agricultural institutes in Guinea

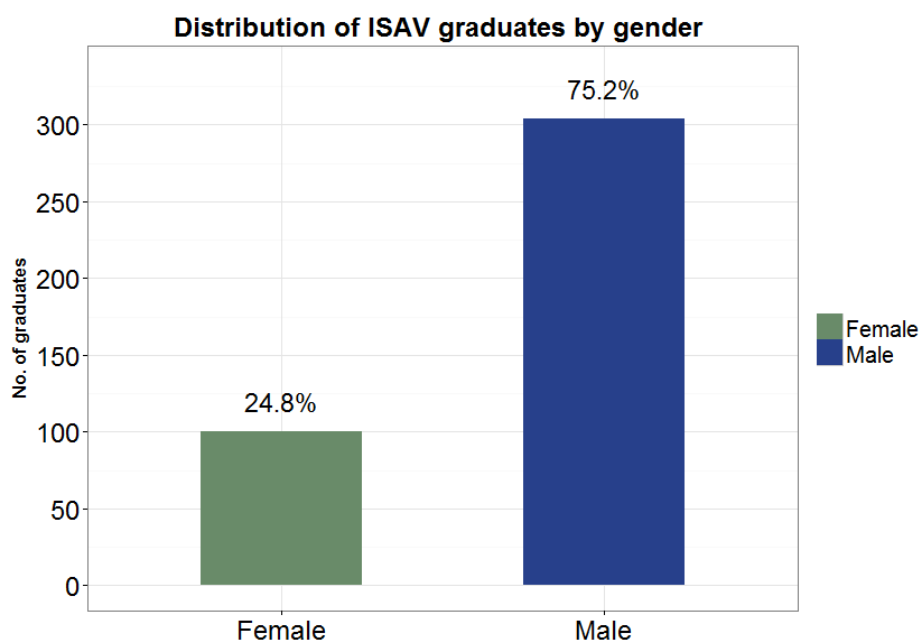
3.1. Descriptive analysis of the telephone survey data

3.1.1. ISAV graduates

The data relating to ISAV graduates are from a randomly selected sample from the lists of graduates over the past five years. This sample represents 10% of graduates in the lists and was numbering 4125. Therefore, the sample size in the study amounted to around 411 graduates. The size of the final sample for the probit analysis amounts to 404 observations due to the elimination of observations with incomplete data. In what follows, the discussion of the sample data structure is based on the final sample (404 graduates).

In terms of the graduate's gender distribution included in the final sample, we find that men represent 75% and women represent 25% (Figure 1).

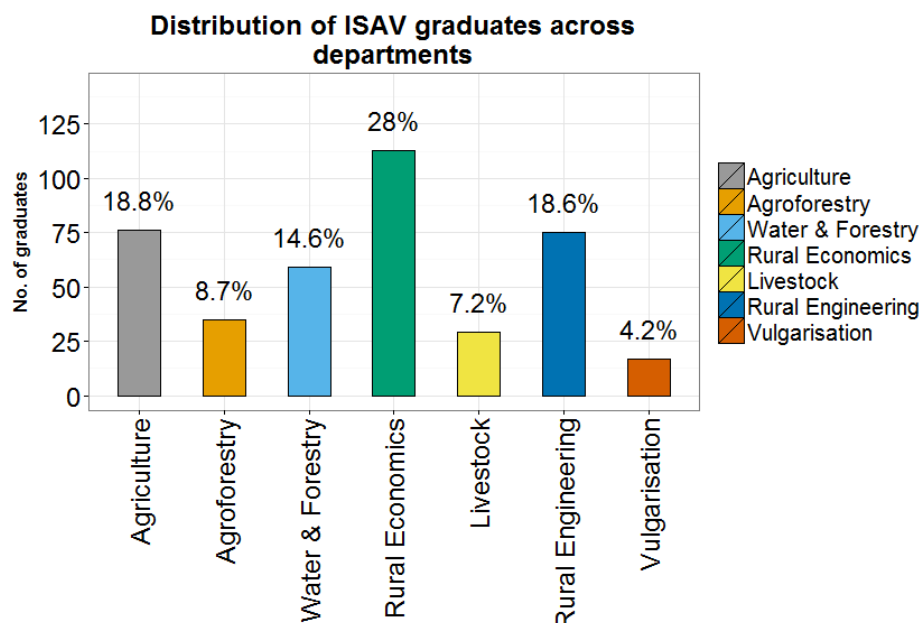
Figure 1: Distribution of the ISAV graduates by gender



Source : Telephone survey, ISAV 2013

Regarding the distribution of ISAV graduates across all fields of study, we find that four fields represent jointly more than 79% of all graduates irrespective of gender. The distribution across the latter is: Rural Economics (28%), Agriculture (18.8%), Rural Engineering (18.6%), and Water and Forests (14.6%). The remaining fields of study represent 21% of graduates with Agroforestry (8.7%), Breeding (7.2%) and Extension (4.2%) (Figure 2).

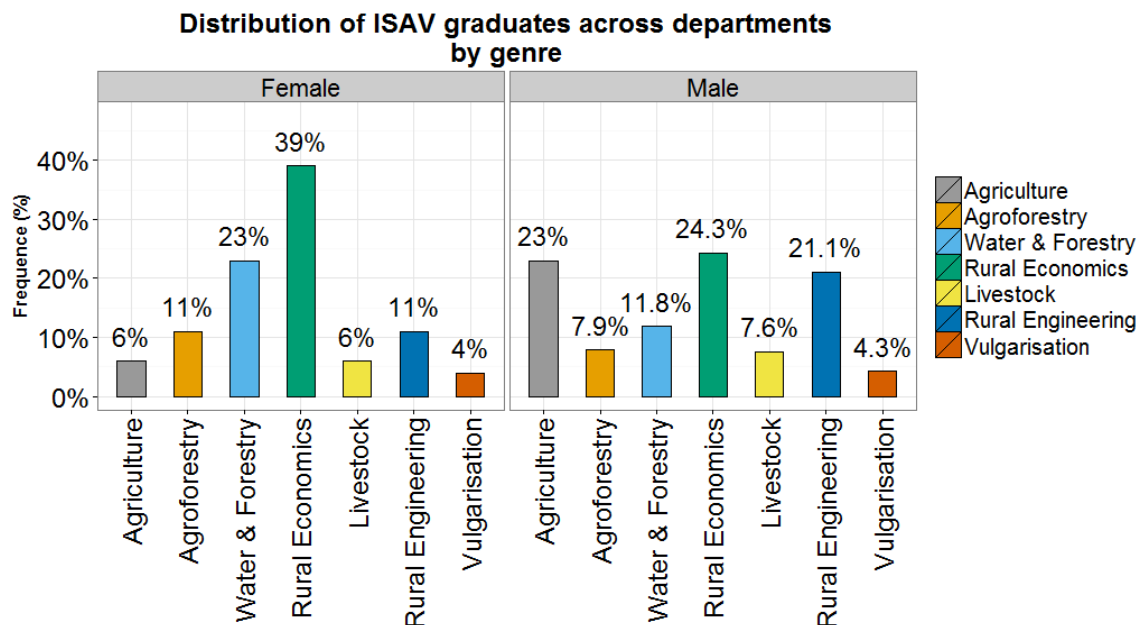
Figure 2: Distribution of ISAV Graduates by department



Source : Telephone survey, ISAV 2013

If we take into consideration the graduates' gender, we find that the distribution across fields of study for male and female graduates differs significantly (Figure 3). For male graduates, we observe that three fields account for over 68% of total male graduates surveyed and which are: Rural Economics (24%), Agriculture (23%) and Rural Engineering (21%). The distribution across the rest of the fields is as follows: Water and Forests (12%), Agroforestry (8%), Breeding (8%) and Extension (4%). For female graduates interviewed, two fields cover over 62% of total female graduates: Rural Economics (39%) and Water and Forests (23%). The distributions across the remaining fields of study are: Agroforestry (11%), Rural Engineering (11%), Agriculture (6%), Breeding (6%) and Extension (4%).

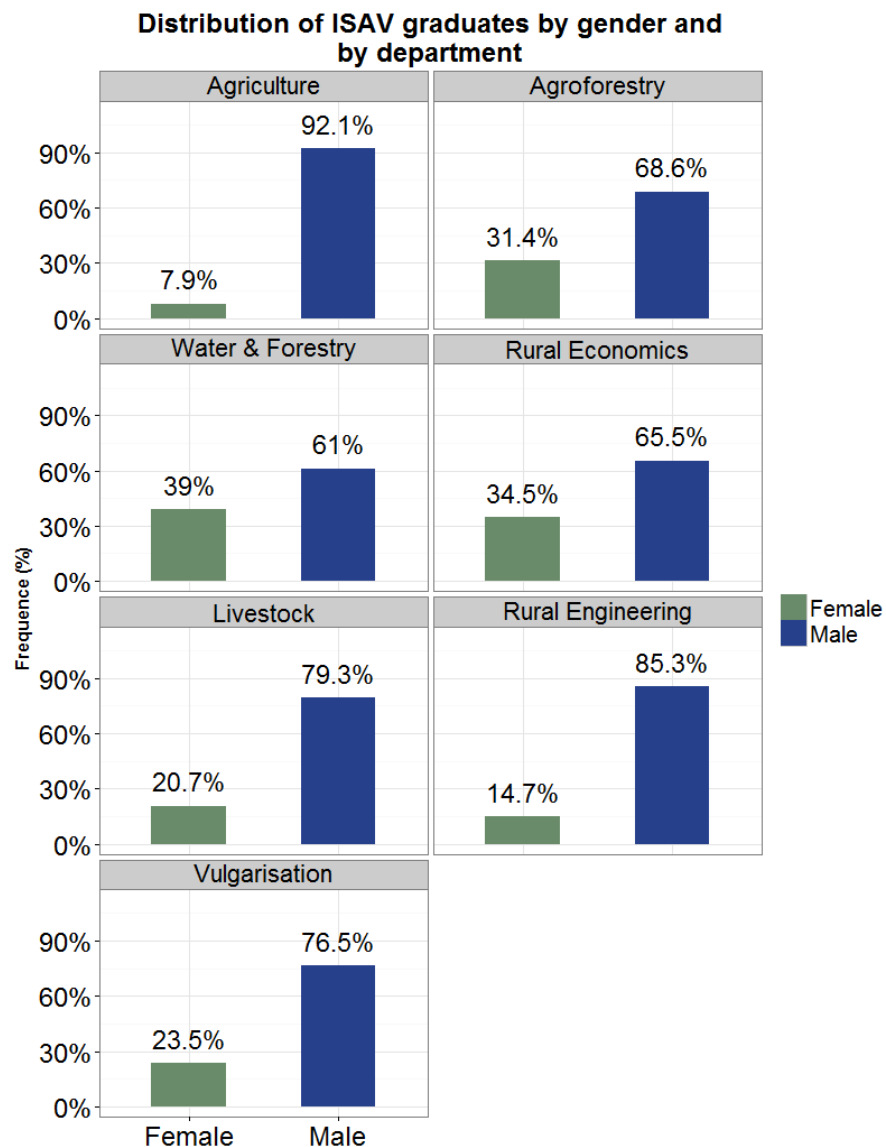
Figure 3: Distribution of ISAV graduates in the departments by gender



Source : Telephone survey, ISAV 2013

In terms of gender parity within fields of study, Figure 4 represents the share of each gender in the cohorts of graduates within each field at ISAV. We observe that male graduates are dominant in all fields. Nevertheless, we notice that in three out of the seven fields of study, the share of women exceeds the threshold of 30%. In this case, female graduates represent 39% of graduates within the field of Water and Forests, 35% within Rural Economics and 31% within Agroforestry respectively. For the remaining fields of study, the share of female graduates is as follows: Extension (24%), Livestock (21%), Rural Engineering (15%) and Agriculture (8%) (Figure 4).

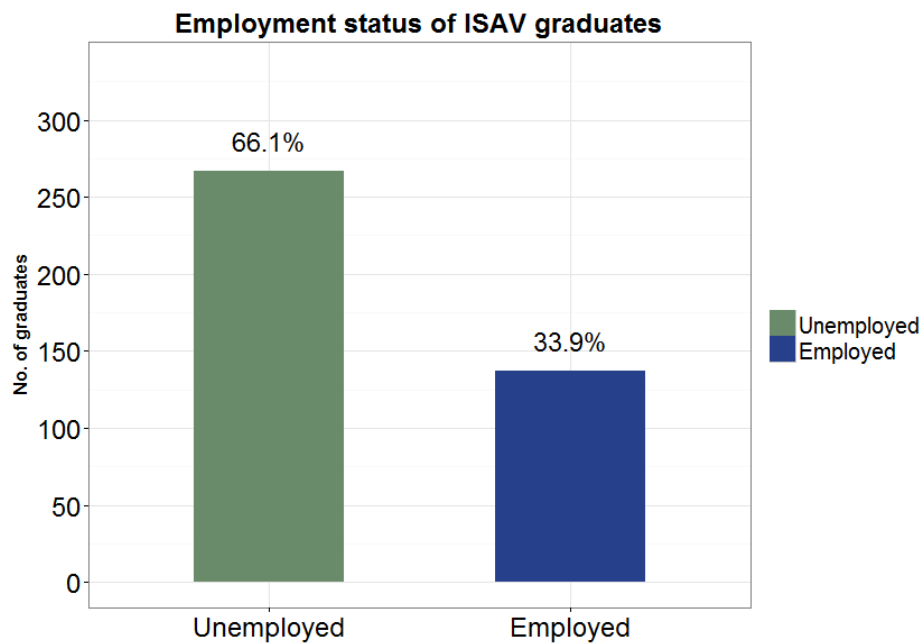
Figure 4: Distribution of ISAV graduates within departments by gender



Source: Telephone survey, ISAV 2013

In terms of employment status, we find that 34% of graduates irrespective of gender are employed (Figure 5).

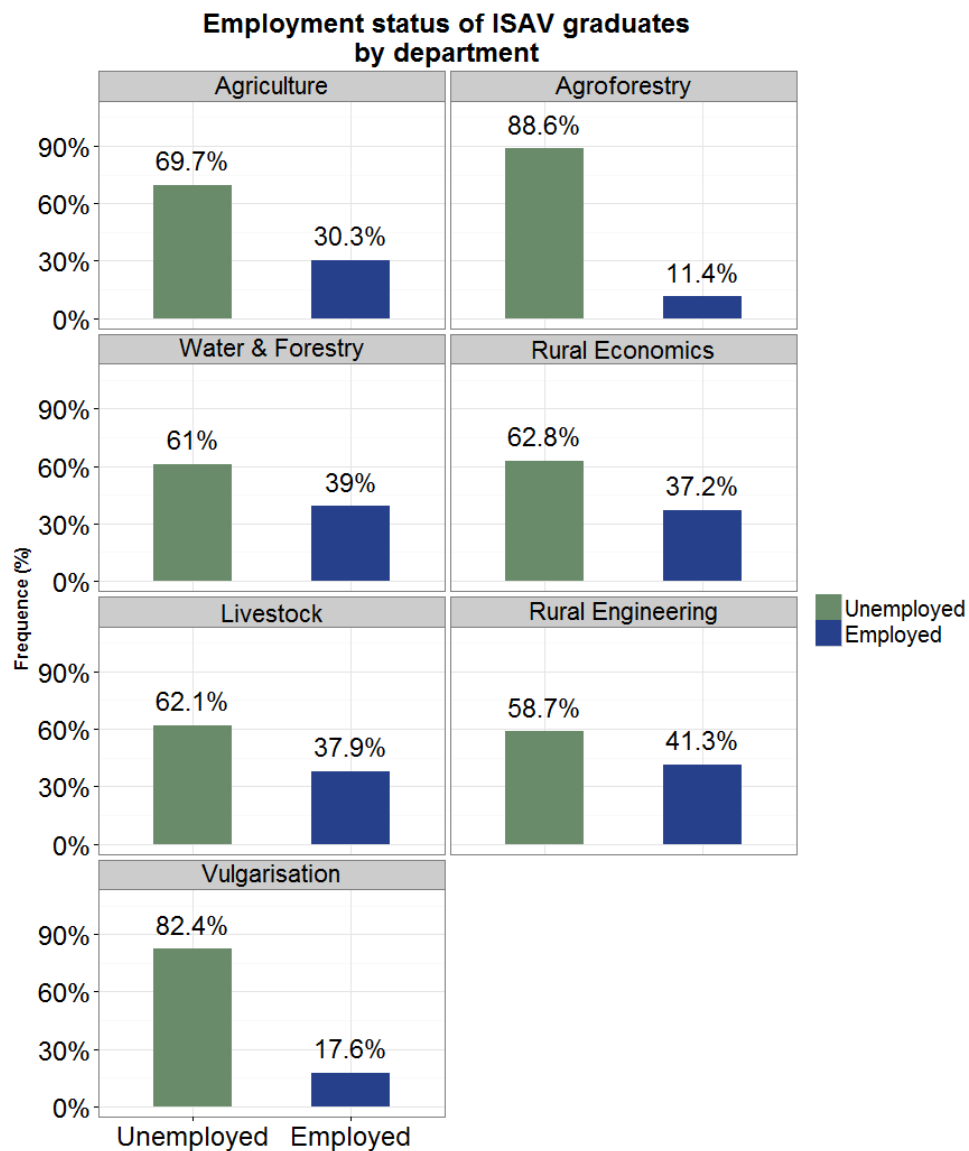
Figure 5: Distribution of ISAV graduates by employment status



Source: Telephone survey, ISAV 2013

When analyzing the dynamics of employment by field of study, we observe that the rate of employment within the fields of study is higher than the average rate of employment across the survey population for four out of the seven fields at ISAV: Rural Engineering (41%), Water and Forests (39%), Livestock (38%) and Rural Economics (37%). For the remaining fields of study, the rate of employment for graduates does not exceed 30% for Agriculture and amounts respectively to around 18% and 11% for Extension and Agroforestry (Figure 6).

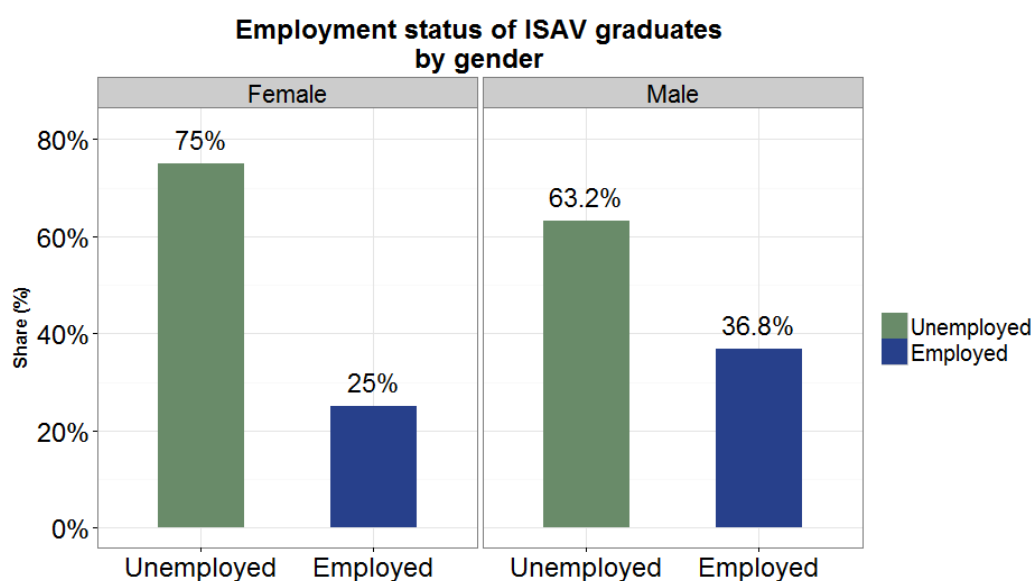
Figure 6: Distribution of graduates by employment status within ISAV departments



Source: Telephone survey, ISAV 2013

If the gender dimension is included, we notice that for male graduates, the employment rate is higher than average in the sample and reaches 37%. The pattern is reversed for female graduates where the employment rate does not exceed 25% (Figure 7).

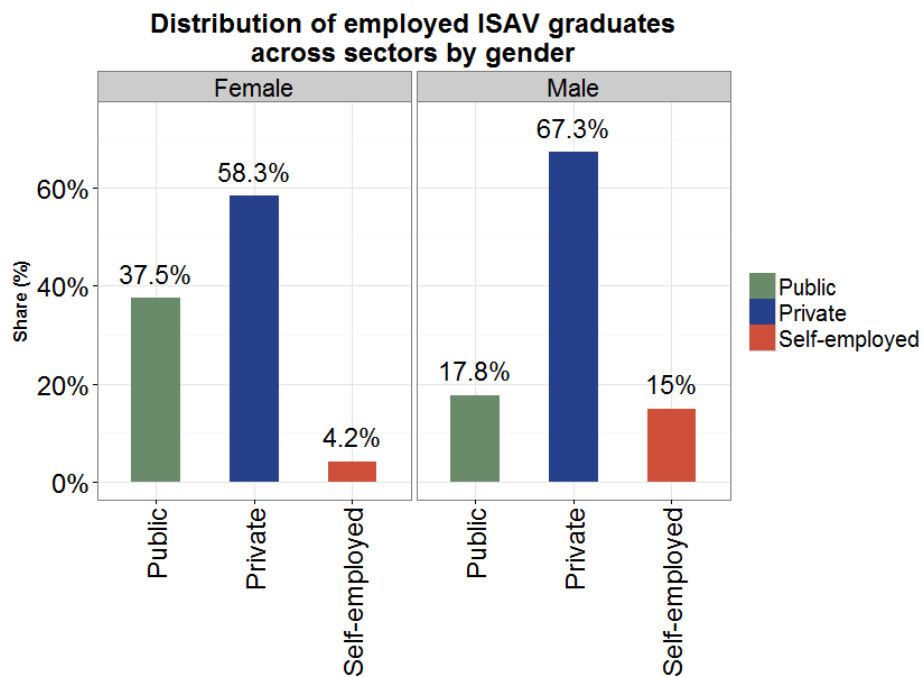
Figure 7: Distribution of ISAV graduates by employment status and gender



Source: Telephone survey, ISAV 2013

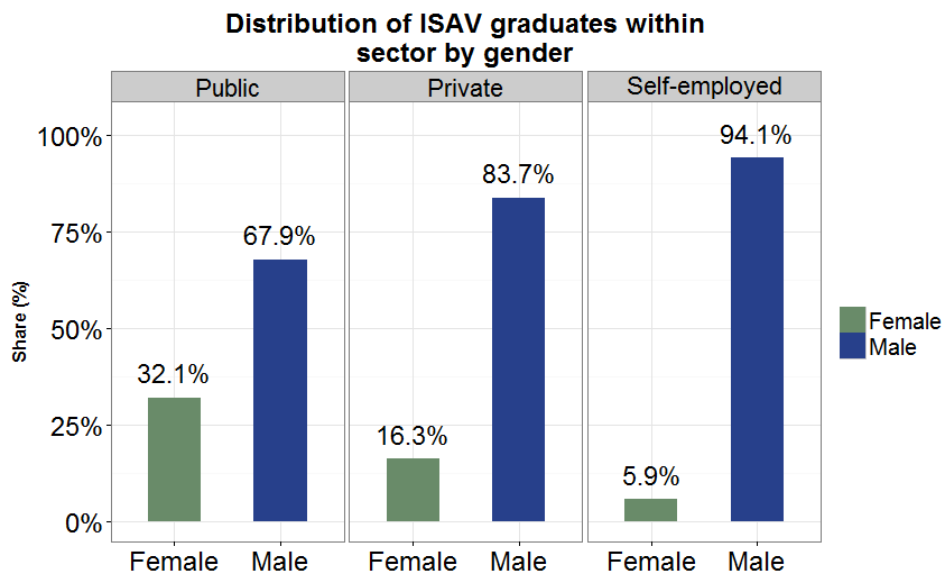
At the sectoral level, we find that the private sector is the major source of employment opportunities. Indeed, 67% of ISAV's male graduates in the survey are employed in the private sector and 58% for female graduates. However, there is a major difference between male and female graduates in terms of sectoral employment within the rest of the sectors. For instance, the public sector employs 38% of of ISAV female graduates compared with 18% for male graduates. On the other hand, self-employment represents only 4% of total female graduates who are active; whereas for male graduates, it reaches 15%. Additionally, we notice that the public sector exhibits closest parity between male and female graduates. Within the cohort of graduates employed in the public sector, 32% are female and 68% are male. For the rest of the sectors, the split between genders is more skewed in favor of male graduates where they represent 84% and 94% respectively of employed graduates within the private sector and the self-employed sector (Figures 8 and 9).

Figure 8: Sectoral shares in the population of ISAV employed graduates by gender



Source: Telephone survey, ISAV 2013

Figure 9: Share of each gender in the population of ISAV employed graduates by sector



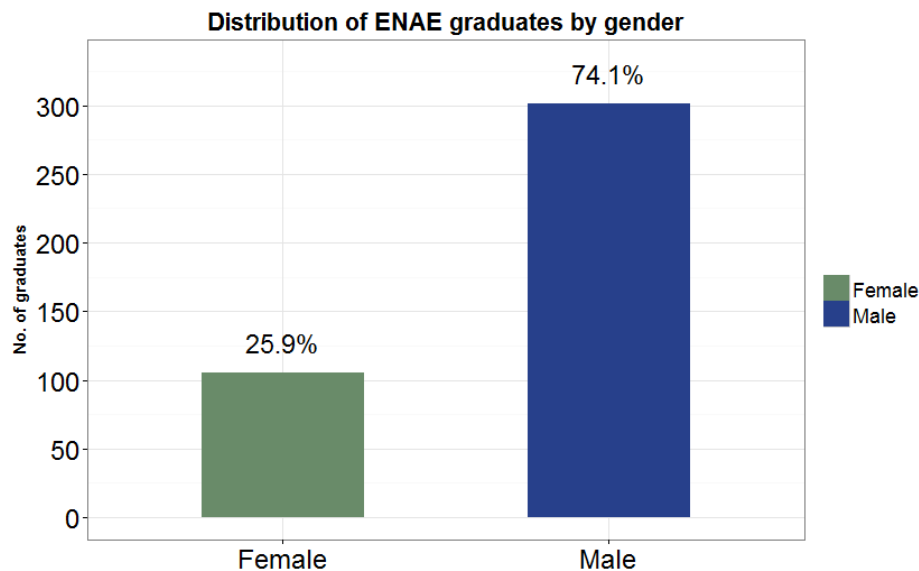
Source: Telephone survey, ISAV 2013

3.1.2. ENAE graduates

The survey data for the ENAE graduates originates from the lists of graduates during the past five years. The sample size in the study is 429 graduates. It should be noted that the size of the original sample corresponds to all graduates over the past five years for which we have phone numbers. The final sample size used for the probit analysis amounts to 406 observations due to the elimination of observations incomplete and/or duplicate data. In what follows, the discussion of the sample data structure is based on the final sample (406 graduates).

In terms of gender distribution of graduates in the final sample, we find that men represent 74% and women represent 26% (Figure 10).

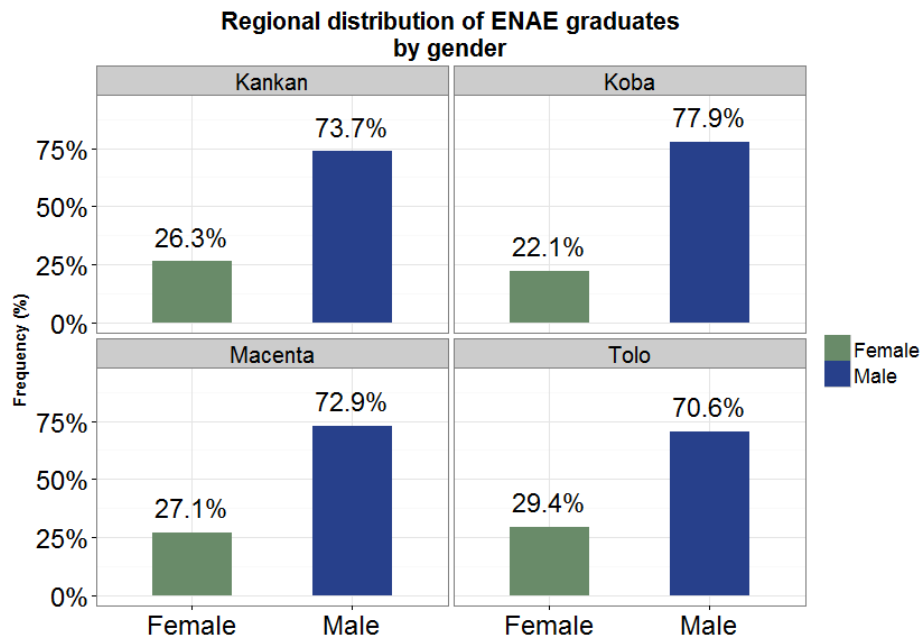
Figure 10: Distribution of the ENAEs graduates by gender



Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

In terms of regional distribution, we find that the share of female graduates within the ENAEs of Kankan, Macenta and Tolo is higher than or equal to the average of the survey population. Indeed, the share of women in the graduate's contingent in the latter reaches 26%, 27% and 29% respectively (Figure 11).

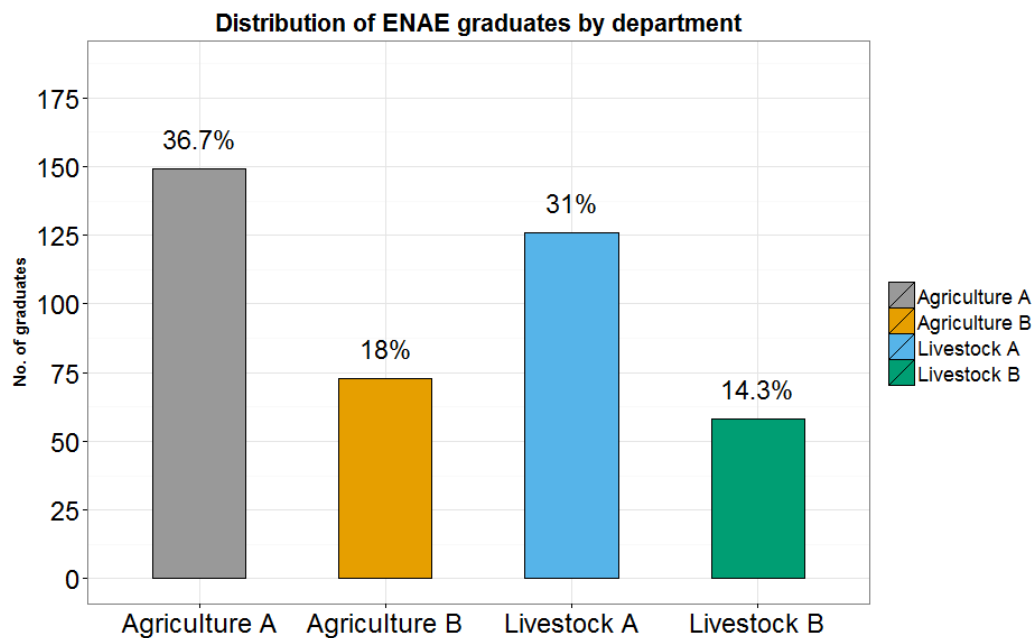
Figure 11: Regional distribution of ENAEs graduates by gender



Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

Regarding the distribution of graduates across the different fields of study within the ENAE, we observe that two fields account for over 68% of graduates irrespective of gender. The latter are namely Agriculture A and Livestock A and which represent 37% and 31% of total population of graduates respectively. The remaining fields of study account for 32% of graduates, with Agriculture B (18%) and Livestock B (14%) (Figure 12). It should be noted that the fields of study denoted with 'A' are reserved for graduates who have received a high school diploma (i.e. baccalaureate degree) at the secondary level; while fields of study 'B' are reserved for graduates without a high school diploma.

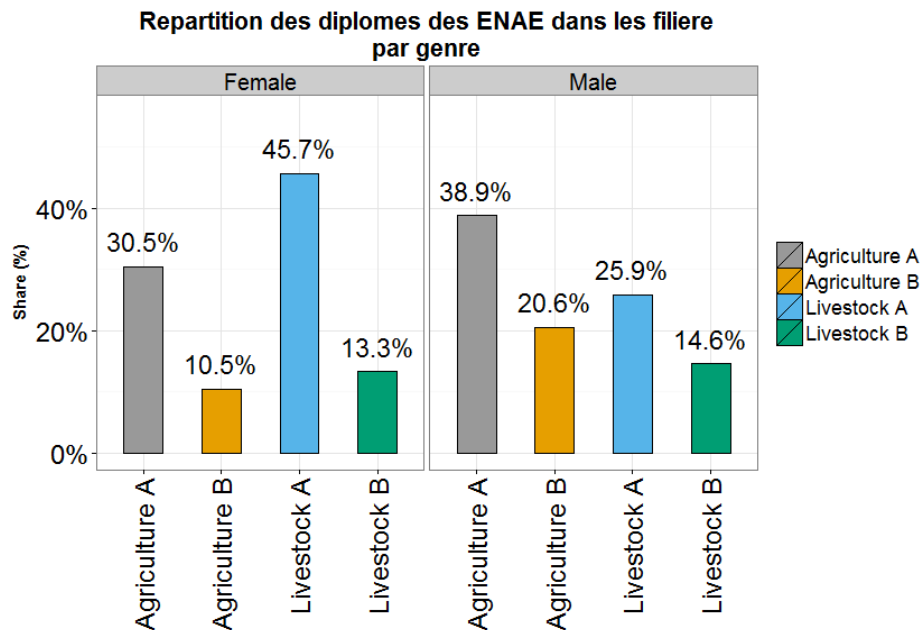
Figure 12: Distribution of ENAEs graduates by sector



Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

If we take into account the gender dimension, we notice that the distribution across the ENAE fields of study for male and female graduates is generally similar. For male graduates, we note that Agriculture A and Livestock A account for 39% and 26% of the total male graduate population respectively. For the Agriculture B and Livestock B, their respective shares in the male graduate population stand at 21% and 15% respectively. For female graduates, Agriculture A and Livestock A represent 46% and 31% of the population of female graduates; while Agriculture B and Livestock B represent 13% and 11% respectively (Figure 13).

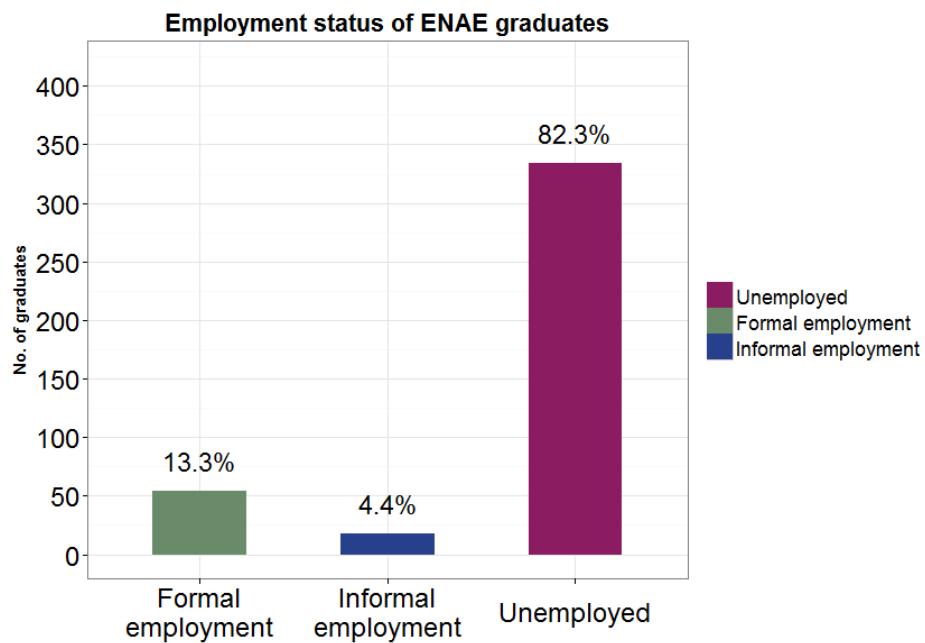
Figure 13: Distribution of graduates within ENAEs departments by gender



Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

In terms of the employment status, we notice that 18% of graduates are employed irrespective of gender, with 13% employed within the formal sector and 5% within the informal sector (Figure 14).

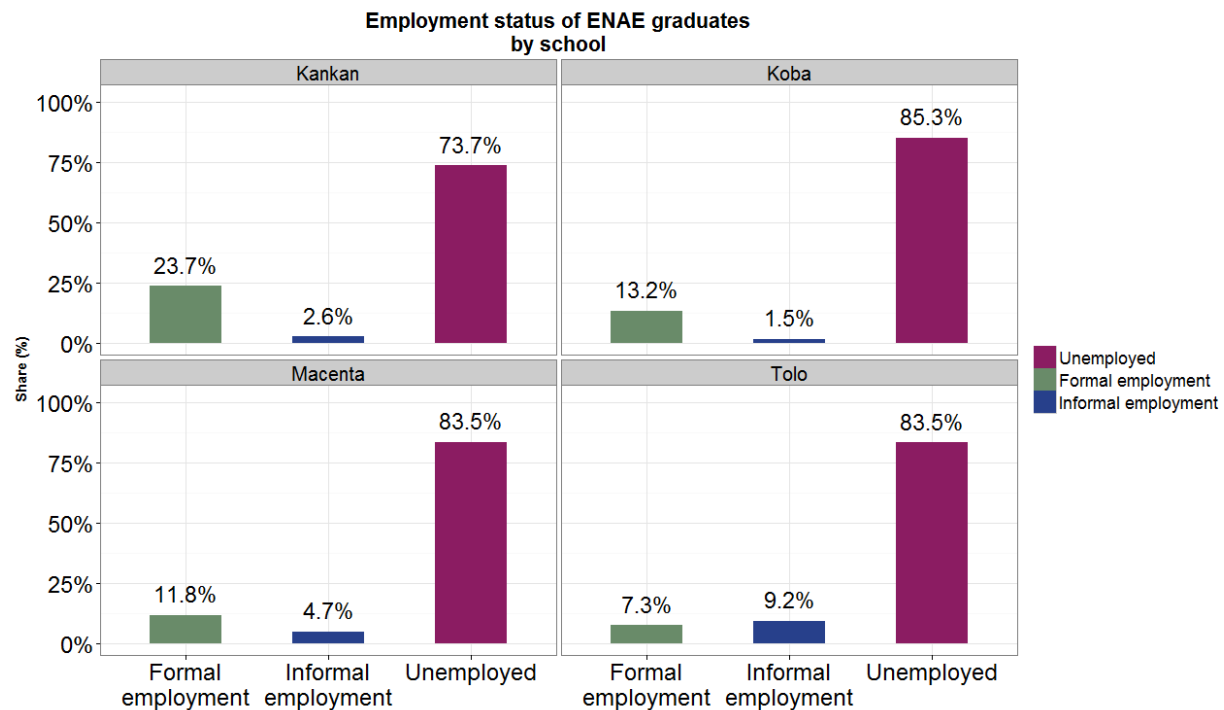
Figure 14: Distribution of ENAEs graduates by employment status



Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

In terms of the regional dynamic of employment within each ENAE, the graduates of ENAEat Kankanare the only ones that exhibit an employment rate higher than the sample's mean and reaches 26%. For the rest of the ENAEs in Koba, Macenta and Tolo, the employment rate does not exceed 17% of all graduates irrespective of gender. At the sectoral level, we observe that most employment opportunities come from the formal sector. Indeed, the latter employs 24%, 13% and 12% of all graduates from the ENAE at Kankan, Koba, and Macenta respectively; whereas for the ENAE at Tolo, a slightly larger group of graduates is employed within the informal sector 9% in comparison with 7% for the formal sector (Figure 15).

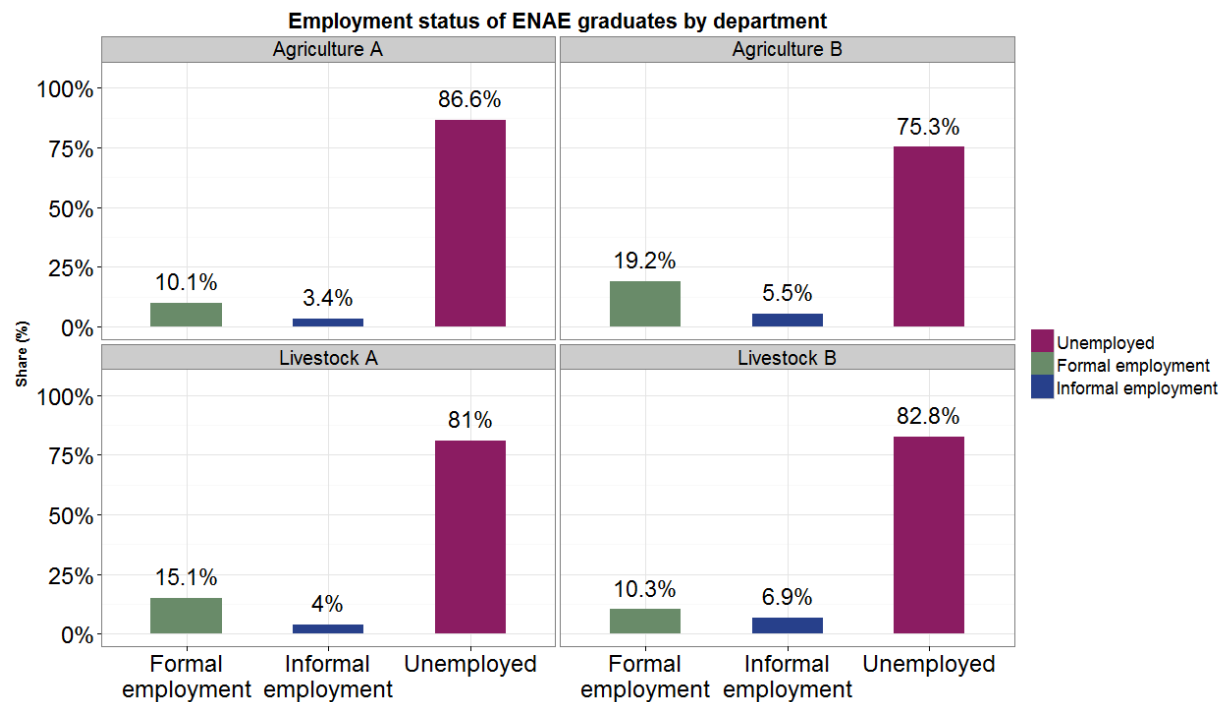
Figure 15: Distribution of ENAEs graduates by employment status and by school



Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

When comparing the employment rates by field of study, we find that two fields exhibit above-average employment rates for their graduates and are as follows: Agriculture B (25%) and Livestock A (19%). Additionally, rates of employment within the formal sector are higher compared with the informal sector. Indeed, among the 14% of employed graduates from Agriculture A, 10% are employed within the formal sector and 4% within the informal sector. For Agriculture B, 19% of all employed graduates work in the formal sector and 6% in the informal sector. For Livestock A, 15% are employed in the formal sector and 4% in the informal sector; whereas these proportions reach 10% and 7% respectively for Livestock B (Figure 16).

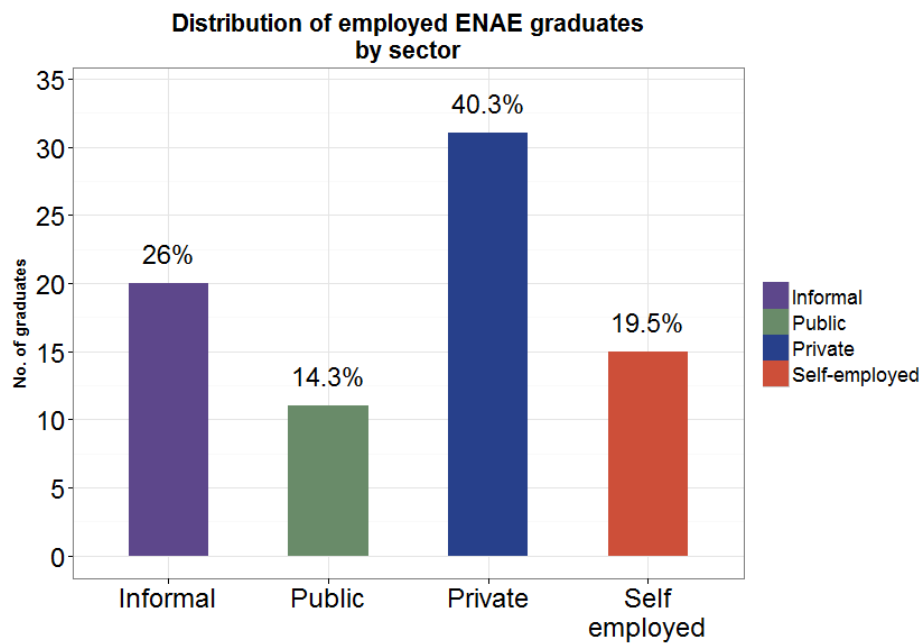
Figure 16: Employment status of ENAEs graduates by department



Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

By analyzing the sectoral employment dynamics of ENAE graduates, we find that the private sector remains the major source of employment opportunities. Indeed, 40% of the total population of graduates is employed in the private sector, followed by the informal sector (26%), Self-employment (20%) and the public sector (14%) (Figure 17).

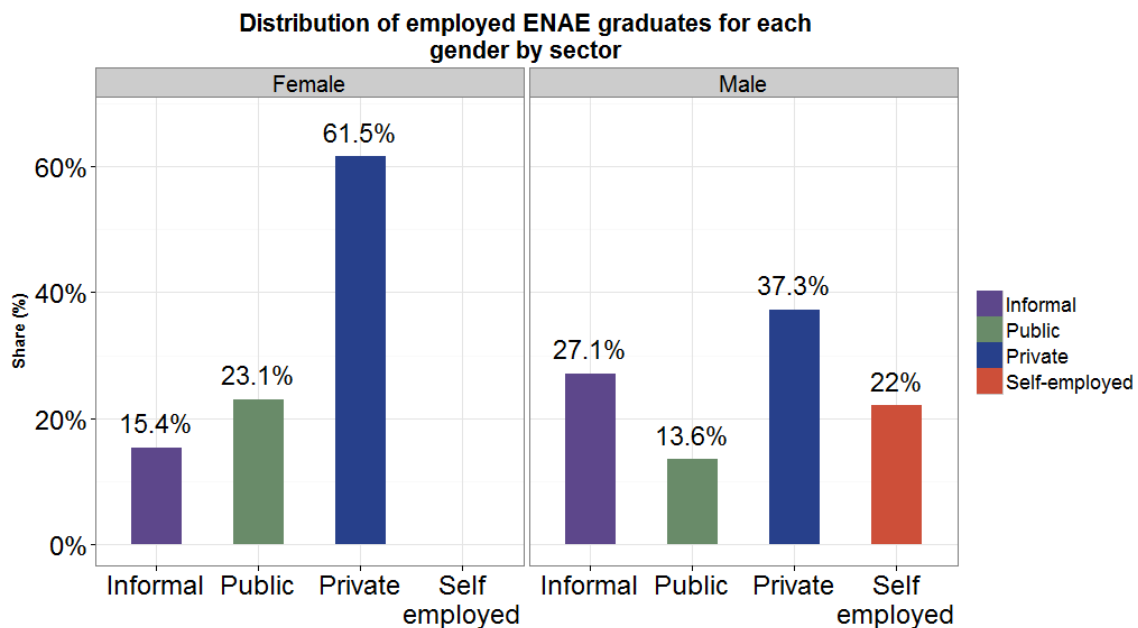
Figure 17: Distribution of ENAEs graduates by employment sector



Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

However, there is a major difference between male and female graduates. In fact, the private sector employs 66% of the ENAE female graduates compared with 37% for male graduates. Another major difference between male and female graduates is the total absence of female graduates in the self-employment category, whereas the latter represents 22% of the male graduates' population (Figure 18).

Figure 18: Sectoral employment of ENAEs graduates by gender



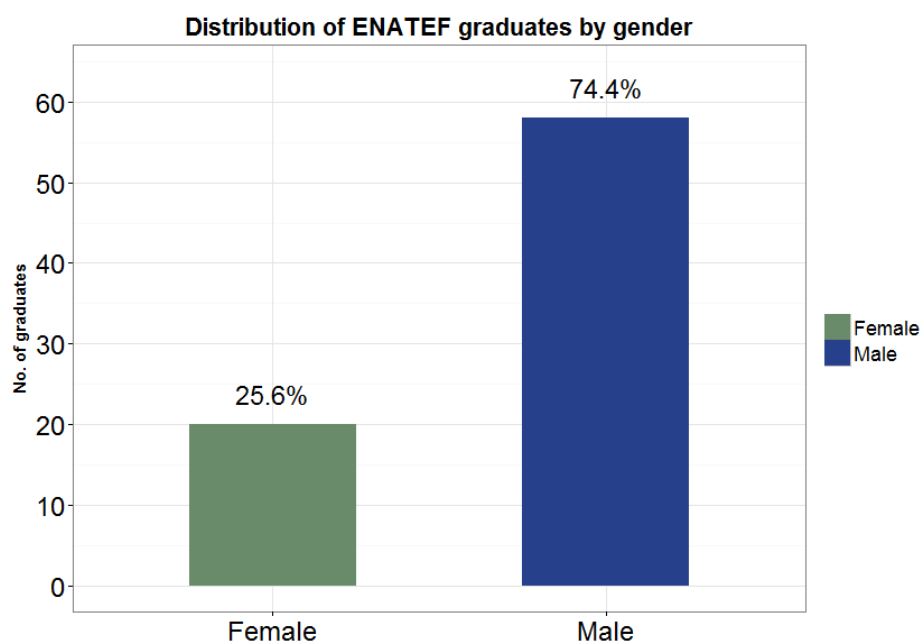
Source: Telephone survey, ENAE (Macenta, Tolo, Koba and Kankan 2014)

3.1.3. ENATEF graduates

The data relative to ENATEF graduates are originated from the lists of graduates during the past five years. The size of the final sample for the probit analysis is 78 observations. In the following, the discussion of the sample data structure is based on the final sample.

In terms of the gender distribution of the graduates, it is observed that men represent 74% of the sample and women represent 26% (Figure 18). The training at ENATEF focuses solely on the water and forest sector.

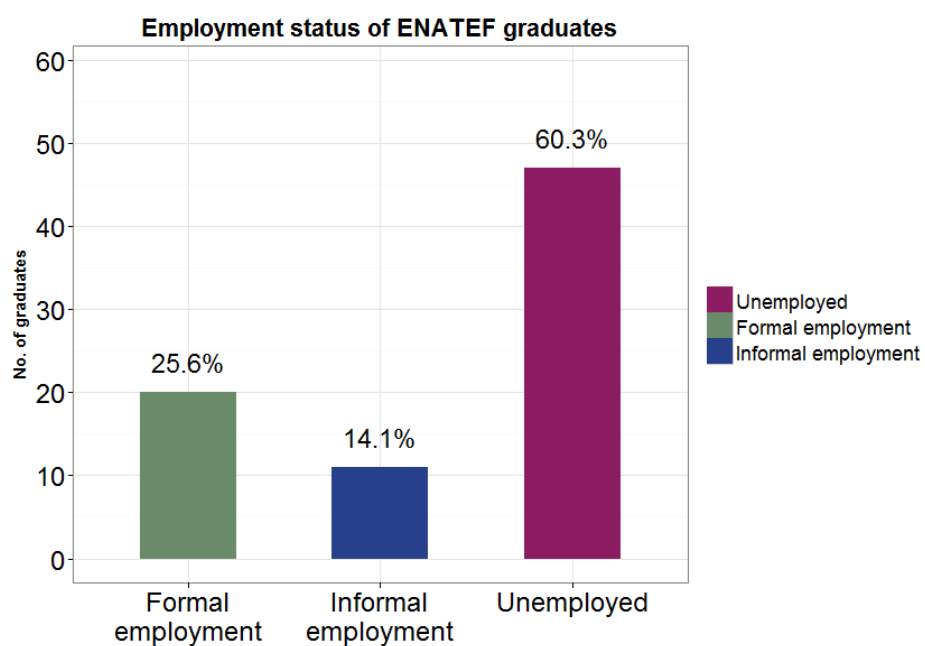
Figure 18: Distribution of the ENATEF graduates sample by gender



Source: Telephone survey, ENATEF 2014

In terms of employment status, we find that 40% of graduates are employed, with 26% employed in the formal sector and 14% in the informal sector (Figure 19).

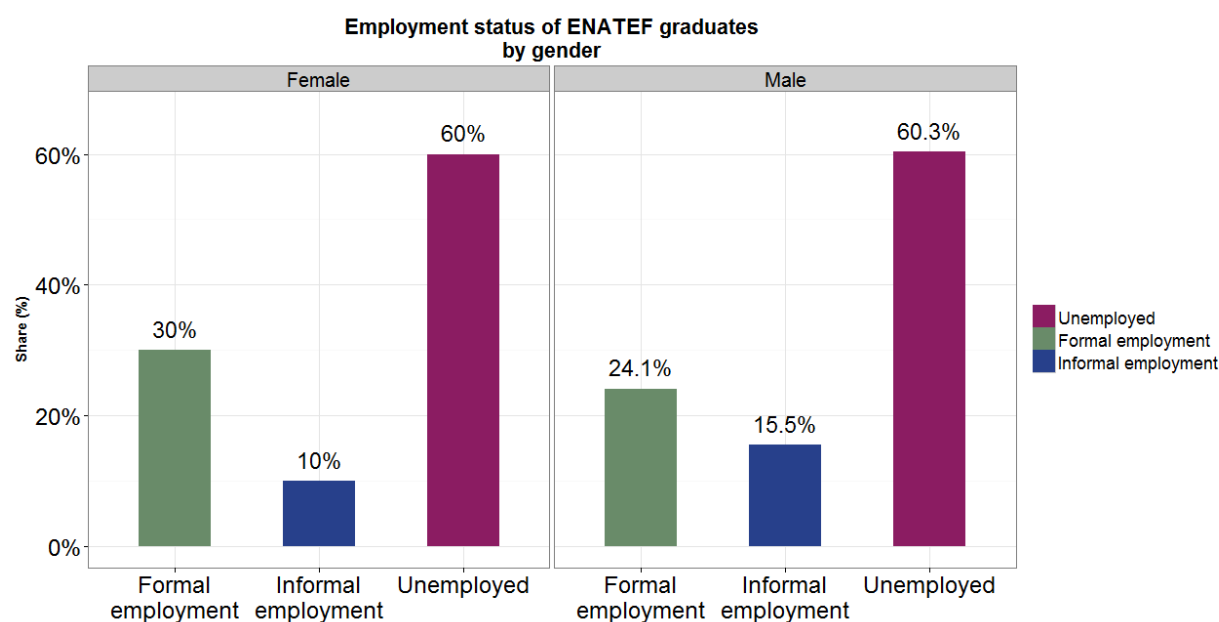
Figure 19: Distribution of ENATEF graduates by employment status



Source: Telephone survey, ENATEF 2014

If we consider gender, we find that the employment rate for male and female graduates is the same and is around 40%. Indeed, employment rates for ENATEF graduates are the only ones that exhibit close gender parity in contrast with employment rates for graduates from ISAV and the ENAE, and which are characterized by a strong bias against female graduates. Additionally, we notice that female graduates from ENATEF benefit more from formal employment in comparison with male graduates. Indeed, rate of employment for female graduates in the formal sector reaches 30% compared with 24% for the male graduates; whereas only 10% of female graduates work in the informal sector compared with 16% for male graduates (Figure 20).

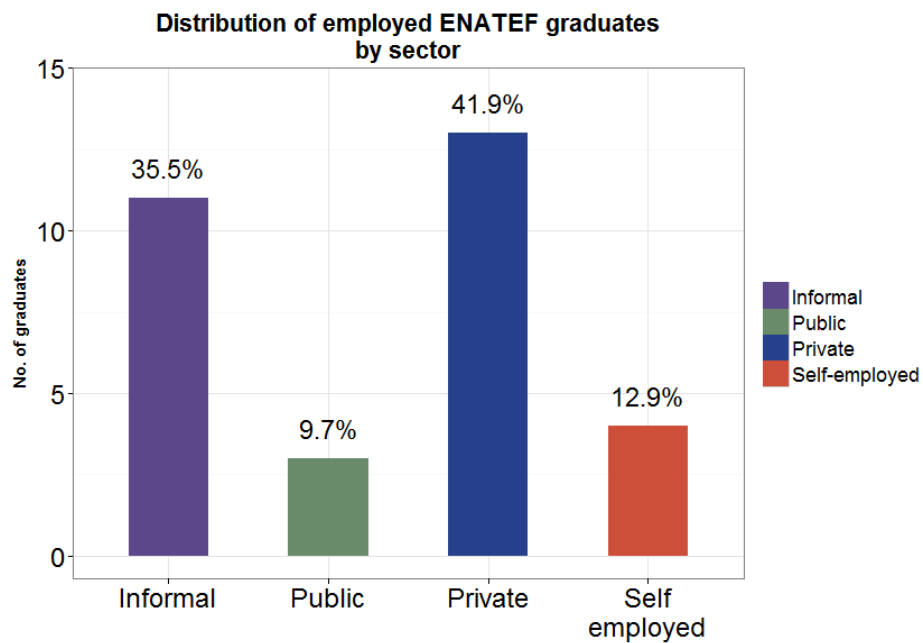
Figure 20: Distribution of ENATEF graduates by employment status and by gender



Source: Telephone survey, ENATEF 2014

In terms of the sectoral employment dynamics, we find that the private sector is the major source of employment opportunities with 42% of graduates who are employed within it irrespective of gender. This is followed by the informal sector employing 36% of all graduates. The public sector and self-employment employ 10% and 13% respectively of the graduates (Figure 21).

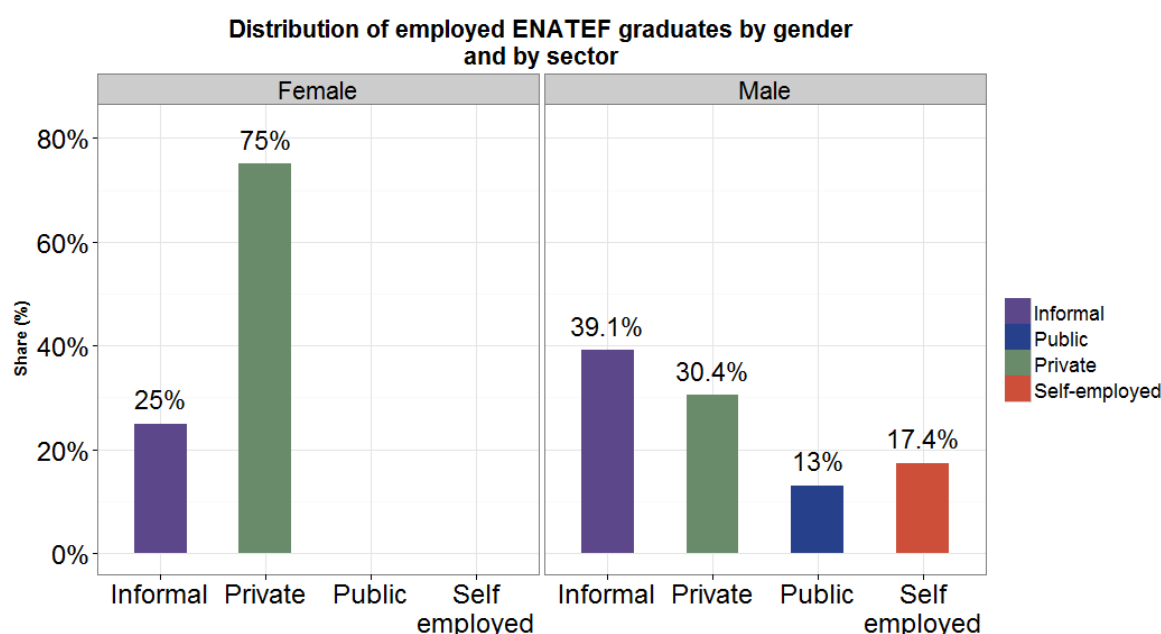
Figure 21: Distribution of ENATEF graduates by employment sector



Source: Telephone survey, ENATEF 2014

If we take into account the gender dimension, there is a major difference between the male and female graduates. Indeed, the latter are only employed by two sectors: the private sector (75%) and the informal sector (25%); while male graduates are represented in all sectors with the informal (39%), private sector (30%), public sector (13%) and self-employment (17%) sectors (Figure 22).

Figure 22: Distribution of ENATEF graduates by employment sector and by gender



Source: Telephone survey, ENATEF 2014

3.2. What factors affect the employability of graduates: A «PROBIT» analysis

From the results of the descriptive analysis, it is clear that the employability of graduates coming from academic and technical training in Guinea is affected by a number of factors: the training institute, gender, area of specialization, etc. To better understand the effect of variables identified on the probability of being employed, we will conduct an econometric analysis using a univariate probit model.

3.2.1. Econometric methodology

Using the data derived from the telephone surveys among the major agricultural training institutions in Guinea, we propose to estimate a univariate probit model of the probability that graduates are employed in the formal sector. The data collected through the surveys cover a number of explanatory variables that might affect the probability of being employed for graduates. In general, the probit model to estimate the probability of being employed for graduates is expressed as follows:

$$Pr(employment_i = 1|X_i) = f(X_i\beta)$$

or:

$$employment_i \begin{cases} = 1, & \text{if the graduate has a formal employment} \\ = 0, & \text{if the graduate does not have a formal employment} \end{cases}$$

with the vector X_i denoting the independent variables affecting the probability of being employed and $f(.)$ the cumulative function of the normal distribution. To this end, we proceed to the analysis using the econometric estimation package *glm*² and the function *mfx* to extract the marginal effects derived from the R econometric program analysis (Fernibough, 2011).

As has already been described, surveys were conducted among the main agricultural training institutions in Guinea, and which are: ISAV, the ENAEs and ENATEF. The retained samples size for the analysis is: ISAV (404), ENAE (406), and ENATEF (78) for a total sample of 888 observations.

Since there are differences in the data obtained in terms of variables covered by the surveys, we propose to estimate several versions of the probit model:

- First, we will estimate an aggregated probit model using data from the three telephone surveys and covering the variables in common in all three data sets.

Table 4 outlines a summary of the variables that were the subject of data collection and that will form the basis for estimating the aggregated probit model.

Table 4: Structure of the probit model estimation variables

Variable ³	Description	Values
<i>employment</i>	Variable denoting the employment status of the interviewed graduates	<i>employment</i> = 1, if formal employee <i>employment</i> = 0, if non-formal employee
<i>school</i>	Variable denoting the training institution	<i>school</i> = 1, if from ISAV <i>school</i> = 2, if from ENAE <i>school</i> = 3, if from ENATEF
<i>gender</i>	Variable denoting the graduate's gender	<i>gender</i> = 1, if male <i>gender</i> = 0, if female

² R documentation (<https://stat.ethz.ch/R-manual/R-devel/library/stats/html/glm.html>)

³ The model's variables corresponding to the question responses in the questionnaires of the telephone surveys and which are: *employment* in response to question E, *satisfaction* in response to question F, *competence* in response to H. For the variables *gender* and *school*, the latter were added to the collected data base and not to the question responses from the questionnaire. The same remains valid for the model's variables discussed in Tables 5 and 6.

<i>satisfaction</i>	Variable denoting the level of satisfaction of the graduates with their training	<i>satisfaction</i> = 1, if bad <i>satisfaction</i> = 2, if average <i>satisfaction</i> = 3, if good <i>satisfaction</i> = 4, if excellent
<i>competence</i>	Variable created from the average personal evaluation scores in terms of communication capacity, analytical analysis, group work, etc.	Continuous variable

Source: Telephone surveys (ISAV 2013, and ENAEs& ENATEF 2014)

- In a second step, we will estimate a disaggregated probit model by dividing the data derived from three telephone surveys between those from ISAV and those from ENAE and ENATEF.⁴

Tables 5 and 6 briefly describe the variables that were the subject of data collection and that will form the basis for estimating the aggregated probit model for ISAV and, ENAE and ENATEF.

Table 5: Structure of ISAV disintegrated probit model estimation variables

Variable	Description	Values
<i>employment</i>	Variable denoting the employment status of the interviewed graduates	<i>employment</i> = 1, if formal employee <i>employment</i> = 0, if non-formal employee
<i>gender</i>	Variable denoting the graduate's gender	<i>gender</i> = 1, if male <i>gender</i> = 0, if female
<i>dept</i>	Variable denoting the training department within ISAV	<i>dept</i> = 1, if Agriculture <i>dept</i> = 2, if Agroforestry <i>dept</i> = 3, if Water & Forests <i>dept</i> = 4, if Rural economics <i>dept</i> = 5, if Breeding <i>dept</i> = 6, if Rural engineering <i>dept</i> = 7, if Vulgarisation
<i>satisfaction</i>	Variable denoting the level of satisfaction of the graduates with their training	<i>satisfaction</i> = 1, if bad <i>satisfaction</i> = 2, if average <i>satisfaction</i> = 3, if good <i>satisfaction</i> = 4, if excellent

⁴ The data derived from the ENAE and ENATEF surveys will be jointly analyzed given the limited number of observations associated with ENATEF survey.

<i>competence</i>	Variable created from the average personal evaluation scores in terms of communication capacity, analytical analysis, group work, etc.	Continuous variable
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Source: Telephone survey (ISAV 2013)

Table 6: Variables used for the ENAE and ENATEF disaggregated probit model estimation

Variable	Description	Values
<i>employment</i>	Variable denoting the employment status of the interviewed graduates	<i>employment</i> = 1, if formal employee <i>employment</i> = 0, if non-formal employee
<i>gender</i>	Variable denoting the graduate's gender	<i>gender</i> = 1, if male <i>gender</i> = 0, if female
<i>dept</i>	Variable denoting the training department within ISAV	<i>dept</i> = 1, if Agriculture A <i>dept</i> = 2, if Agriculture B <i>dept</i> = 3, if Breeding A <i>dept</i> = 4, if Breeding B <i>dept</i> = 5, if Water & Forests
<i>satisfaction</i>	Variable denoting the level of satisfaction of the graduates with their training	<i>satisfaction</i> = 1, if bad <i>satisfaction</i> = 2, if average <i>satisfaction</i> = 3, if good <i>satisfaction</i> = 4, if excellent
<i>competence</i>	Variable created from the average personal evaluation scores in terms of communication capacity, analytical analysis, group work, etc.	Continuous variable
<i>english</i>	Variable denoting the English proficiency level of the graduates	<i>english</i> = 1, if none <i>english</i> = 2, if beginner <i>english</i> = 3, if reads and writes well

Source: Telephone survey (ENAEs and ENATEF 2014)

It is noteworthy that the collected data from the ISAV survey does not contain information on employment in the informal sector. However, ENAE and ENATEF surveys include data relating to employed graduates in the informal sector. Therefore, the aggregated

probit model is estimated without the inclusion of the observations on exiting employees in the informal sector to avoid biased estimates of the employment probability. The latter have also been omitted for estimating the disaggregated model of the ENAEs given that the objective of the study is the investigation of factors affecting employment in the formal sector.

3.2.2. Discussion of the empirical estimation results

3.2.2.1. Aggregatedprobit model

As it was argued above, the aggregate probit model will be estimated using the variables identified from the collected and aggregated data for the three telephone surveys (Table 4). From the results of the estimation of the aggregated probit model, we find that the variables "*gender1*", "*school2*" and "*competence*" significantly influence the probability of the graduates to being employed in the overall sample. Table 5 and 6 respectively present the results of the estimation of the aggregated model coefficients, and the estimation of the marginal effects.

Table 5: Results of the aggregated probit model regression

	<i>Dependent variable: employment</i>	
gender1(=MALE)	0.239	**
	(0.12)	
school2(=ENAE)	-0.554	***
	(0.11)	
school3(=ENATEF)	-0.101	
	(0.18)	
satisfaction3	0.12	
	(0.18)	
satisfaction4	0.188	
	(0.20)	
competence	0.302	***
	(0.10)	
constant	-1.732	***
	(0.35)	
Observations	856	
Likelihood ratio	-446	
Akaike Inf. Crit. (AIC)	906	
R2 Pseudo (McFadden)	7	

Hannan-Quinn Criterion	918
Schwarz's Bayesian Criterion	939
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1	

Table 6: The marginal effects

	dF/dx	Std. Err.	z	P>	z	
gender1(=MALE)	0.069	0.032	2.191	0.028	*	
school2(=ENAE)	-0.164	0.030	-5.409	0.000	***	
school3(=ENATEF)	-0.030	0.054	-0.595	0.552		
satisfaction3	0.036	0.054	0.669	0.503		
satisfaction4	0.059	0.064	0.917	0.359		
competence	0.092	0.031	3.001	0.003	**	

Sign. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

dF/dx is for discrete change for the following variables:

[1] "gender1" "school2" "school3" "satisfaction3" "satisfaction4"

Source: Simulation results

First, we find all the variables positively correlated with the probability of being employed with varying degrees of significance. The exception being the variables "*school2*" and "*school3*" denoting a negative effect on the probability of formal employment for ENAE and ENATEF compared with the ISAV graduates. The *gender1* and *competence* variables exhibit positive and significant effects on the probability of employment.

For the first variable, "*gender*", we conclude that being a male graduate ("*gender1*") has a comparative advantage in the formal labor market in relation to female graduates. Indeed, the results of the estimation of the associated marginal effects suggest that being a male graduate increases the probability of being employed by 7% in comparison with female graduates. The competence level of the graduates measured by the "*competence*" variable, we conclude that for each unit gain, the probability of employment is increases by 9% across all schools.

Regarding the "*school*" variable, we conclude that being an ENAE ("*school2*") or ENATEF graduate ("*school3*") is associated with probabilities of negative employment. Indeed, based on the estimated marginal effects, we find that being an ENAE graduate reduces the probability of being in formal employment by 16% in comparison with an ISAV graduate (statistically significant). For an ENATEF graduate, the probability of formal employment is

reduced by 3% compared with an ISAV graduate; however, this result is not statistically significant.

The "*satisfaction*" variable positively influences the probability of being employed. However, its effect remains insignificant (Table 7).

To better understand the employment dynamics at different agronomic training institutions, we estimate two disaggregated probit models. The discussion of results is presented in the following sections.

3.2.2.2. ISAV probit model

In this section, we present the estimation results of the ISAV disaggregated probit model. Table 5 describes the variables included in the empirical estimation of the model.

From the results, we conclude that the included variables positively affect the probability of being employed with the exception of the "*dept*" variable which will be discussed in more detail in what follows. Table 7 and 8 respectively present the results of the disaggregated probit model coefficients, and the estimation of the marginal effects.

Table 7: Results of the ISAV probit model estimation

	<i>Dependent variable:</i>	
	employment	
gender1(=MALE)	0.39 (0.17)	*
dept2(=Agroforestry)	-0.67 (0.33)	*
dept3(=Water & Forests)	0.46 (0.24)	.
dept4(=Rural Economics)	0.35 (0.21)	.
dept5(=Breeding)	0.18 (0.29)	
dept6(=Rural engineering)	0.27 (0.22)	
dept7(=Extension)	-0.52 (0.40)	
satisfaction3	0.14 (0.28)	
satisfaction4	0.35 (0.30)	
competence	0.71 (0.15)	***
constant	-3.43 (0.59)	***
Observations	402	
Likelihood ratio	-234	
Akaike Inf. Crit. (AIC)	488	
R2 Pseudo (McFadden)	9	
Hannan-Quinn Criterion	506	
Schwarz's Bayesian Criterion	532	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

notes: Standard errors are represented by the values in parenthesis under the coefficients

Source: Estimation results

Table 8: The marginal effects

	dF/dx	Std. Err.	z	P>	z	
gender1(=Male)	0.133	0.053	2.505	0.012	*	
dept2(=Agroforestry)	-0.200	0.076	-2.623	0.009	**	
dept3(=Water & Forests)	0.172	0.093	1.853	0.064	.	
dept4(=Rural Economics)	0.126	0.077	1.638	0.101		
dept5(=Breeding)	0.066	0.110	0.600	0.549		
dept6(=Rural engineering)	0.098	0.082	1.202	0.229		
dept7(=Extension)	-0.160	0.102	-1.579	0.114		
satisfaction3	0.048	0.099	0.490	0.624		
satisfaction4	0.130	0.114	1.141	0.254		
competence	0.252	0.054	4.669	0.000	***	

Sign. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

dF/dx is for discrete change for the following variables:

[1] "gender1" "dept2" " dept 3" " dept 4" " dept 5" " dept 6"
" dept 7" "satisfaction3" "satisfaction4"

Source: Simulation results

If we consider the significance of the estimated coefficients, we find that the "*competence*" variable is in the first position, followed by the "*gender*" and "*dept*" variables (Table 7).

Table 10 summarizes the results of the estimation of the marginal effects. For the first variable, "*competence*", we conclude that for a unit gain in terms of competence, the probability of being employed for an ISAV graduate increases by 25%. The "*gender*" variable also has a significant impact on the probability of being employed. Indeed, being a male ISAV alumni is associated with an increased probability of being in employment ranging at 13% in comparison with his female ISAV alumni counterpart.

Regarding the "*dept*" variable, we find that in comparison with their fellows from the "Agriculture" department ("*dept1*"), the probability of being employed for ISAV alumnus from the "Agroforestry" department ("*dept2*") decreases by 20% for all kinds. The opposite is observed for "Water and Forests" ("*dept3*") and "Rural Economics" ("*dept4*") departments,

where we observe that ISAV alumnus coming from there have a higher probability of being employed than their fellows from the "Agriculture" department (respectively + 17% and + 13%).

The "*satisfaction*" variable positively influences the probability of being employed. However, its effect remains insignificant (Table 8).

3.2.2.3. ENAE probit model

In this section, we present the results of estimating the ENAE disaggregated probit model (by inclusion of ENATEF). Table 6 shows the variables included in the empirical estimation of the model.

From the results, we find that only the "*dept2*" and "*dept5*" variables have a statistically significant and positive effect on the probability of employment for the ENAEs and ENATEF graduates. The remaining variables exhibit statistically insignificant effects, but with different signs. The "*competence*" and "*englishNew*" variables have a negative impact on the probability of being employed; while "*gender1*" and "*satisfaction*" variables are associated with a positive impact. For the "*englishNew*" variable, the latter is specific to the data collected from the ENAEs and ENATEF surveys. Therefore, it is omitted from the aggregated model and ISAV disaggregated model estimates. Tables 9 and 10 respectively present the results of estimating the disaggregated model coefficients of the ENAEs and ENATEF, and the estimation of the marginal effects.

Table 9: Results of the ENAEs probit model

	<i>Dependent variable:</i>	
	employment	
gender1(=Male)	0.13 (0.17)	
dept2(=Agriculture B)	0.42 (0.23)	.
dept3(=Breeding A)	0.20 (0.20)	
dept4(=Breeding B)	-0.07 (0.28)	
dept5(=Water & Forests)	0.71 (0.23)	**
satisfaction3	0.24 (0.26)	
satisfaction4	0.35 (0.29)	
competence	-0.04 (0.15)	
englishNew2	-0.10 (0.17)	
englishNew3	-0.25 (0.48)	
Constant	-1.42 (0.46)	**
Observations	448	
Likelihood ratio	-189	
Akaike Inf. Crit. (AIC)	400	
R2 Pseudo (McFadden)	4	
Hannan-Quinn Criterion	418	
Schwarz's Bayesian Criterion	445	
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1		

Source: Estimation results

Table 10: The marginal effects

	dF/dx	Std. Err.	z	P>	z	
gender1(=Male)	0.029	0.038	0.762	0.446		
dept2(=Agriculture B)	0.112	0.068	1.647	0.100	.	
dept3(=Breeding A)	0.050	0.052	0.965	0.334		
dept4(=Breeding B)	-0.016	0.062	-0.253	0.800		
dept5(=Water & Forests)	0.207	0.076	2.720	6.52E-03	**	
satisfaction3	0.055	0.056	0.995	0.320		
satisfaction4	0.090	0.081	1.110	0.267		
competence	-0.009	0.035	-0.262	0.794		
englishNew2	-0.024	0.037	-0.637	0.524		
englishNew3	-0.052	0.085	-0.603	0.546		

Sign. Codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

dF/dx is for discrete change for the following variables:

[1] "gender1" "dept2" " dept 3" " dept 4" " dept 5"

[10] "satisfaction3" "satisfaction4" "englishNew2" "englishNew3"

Source: Estimation results

Table 10 presents the results of the estimation of the marginal effect of the ENAESs and ENATEF disaggregated probit model. We note that for the statistically significant variables, namely "*dept2*" et "*dept5*" that are associated with 'Agriculture B' department in the ENAES and 'Water and Forests' department in ENATEF, the probability of being formally employed for the graduates increases by 11% and 21% respectively compared with the graduates from the 'Agriculture A' department. For the remaining variables, the effects on the probability of being in formal employment are insignificant.

3.3. Qualitative analysis of the impression of graduates in regards to ISAV, the ENAEs' and ENATEF training

Telephone surveys conducted with graduates of various agricultural training institutes included questions with a qualitative dimension and aiming to capture the evaluation carried by the graduates vis-à-vis the training quality. In what follows, we will provide a summarized

analysis of the graduate's comments by analyzing the qualitative responses for each of the selected institutions.

3.3.1. ISAV graduates

For ISAV graduates, we note that the questionnaire developed for the telephone survey contained questions including the option to share their opinion with respect to the quality of the received training, the wish to resume and/or continue their education, areas to improve in the training within ISAV, etc.

In general, the majority of graduates express a satisfaction with the quality of training offered within ISAV. The graduate's comments express a satisfaction with the teacher's quality, the curriculum of education, etc. However, only a minority make the link between their satisfaction and the employment opportunities to which they had access.

In terms of further training, a majority of graduates say they are prepared to resume their education and acquire knowledge more relevant to the labor market. In this case, this trend can be interpreted as a sign of decoupling on one side between the training and obtained competence, and the needs of the labor market on the other hand. To this end, one of the critical dimensions and which was raised by the majority of graduates is the need in IT infrastructure, laboratory equipment, internet access, etc.

3.3.2. ENAE graduates

Regarding the interviewed graduates through the telephone survey, the following conclusions are highlighted in terms of the qualitative evaluation carried by the latter on a number of dimensions related to their training:

- the coupling between theory and field practice was one of the most mentioned aspects and appreciated by graduates in terms of training evaluation at the different ENAEs;
- positive opinions on the faculty within the ENAEs, despite the lack of academic resources raised by several comments;
- a majority of graduates spoke in favor of further training in the field of vegetable farming and breeding (mainly poultry production).

In terms of general proposals for training improvement within the ENAES, most reviews have focused on the need to:

- invest in IT tools and the introduction of English in the curriculum;
- conduct faculty training to improve their educational skills;
- implement conventions with potential employers in order to better understand the dynamics of the labor market through the provision of internships and/or the opportunity for collaboration in capstone projects;
- establish a network of partnerships with other schools and/or universities.

3.3.3. ENATEF graduates

The main findings emerged from the telephone survey among ENATEF graduates in terms of assessing their training revolve around:

- a good integration between theory and practice in the field;
- good instructors;
- an availability of internships and studies field trips sponsored by the Institute;

In terms of the general proposals for training improvement within the ENAES, most reviews have focused on the need to:

- broaden the curriculum to offer extensive training in the departments of silviculture, topography, and vulgarization;
- invest in IT tools and the introduction of English teaching;
- invest in laboratory tools and field practice.

4. Employers interviews

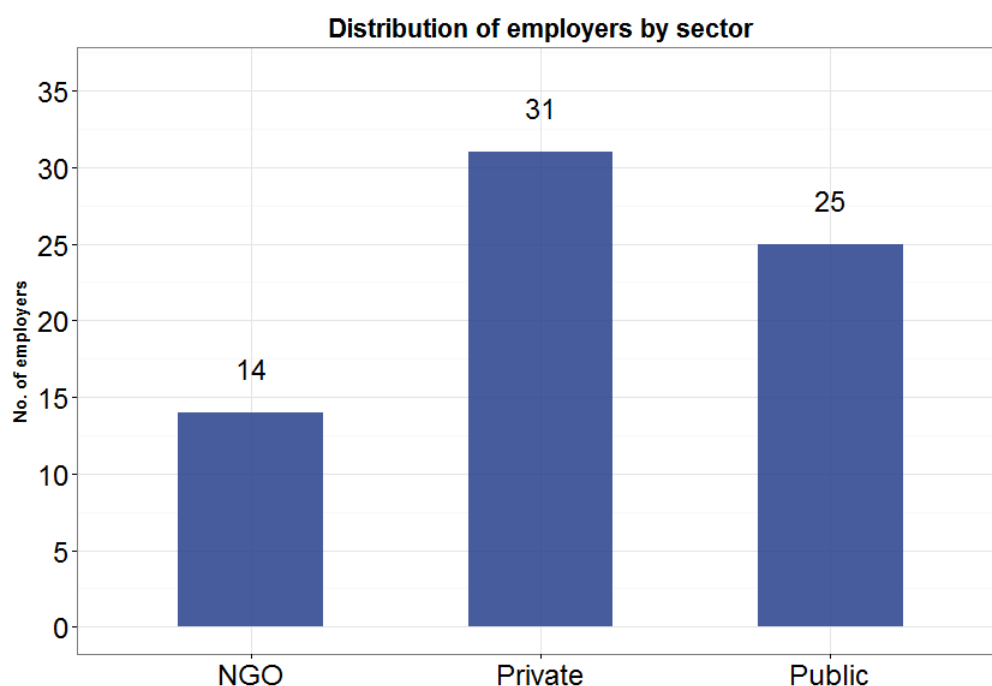
4.1. Quantitative descriptive analysis

In this section, we proceed to analyze the evolution of employment opportunities in the Guinean agricultural labor market. The relative data on the questionnaires administered to historical and potential employers of ISAV, the ENAES' and ENATEFs graduates. Through the

collected data, we will attempt to approximate the dynamics of the employment offer. Obviously, this analysis is limited in the sense that the survey only covers a sample of employers in the formal sector.

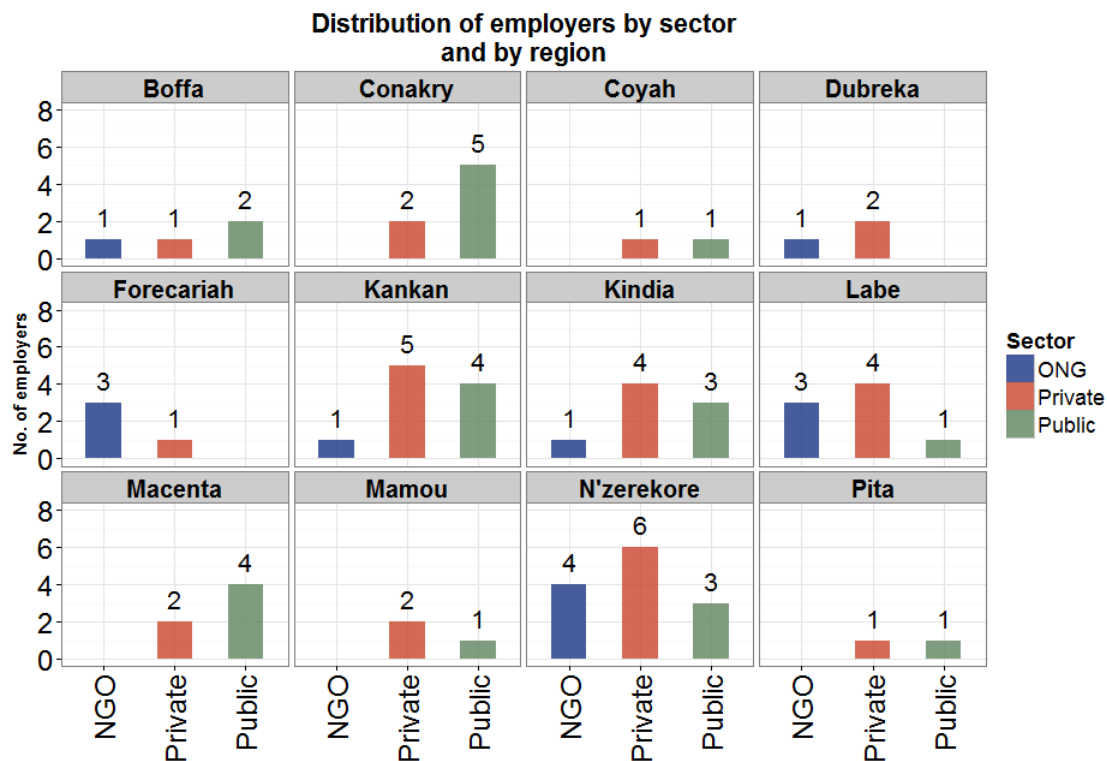
Figure 29 briefly describes the general composition of the employers interviewed during the investigation. We note that the private sector is strongly represented where the majority of employers interviewed are operating (31 of the 70 interviewed employers). Employers in the public sector follow with 25 employers and finally the NGO sector with 14 employers. In terms of regional distribution, the same finding is noted where it is observed that the entities operating in the private sector are the majority in the sample. The exception being the regions of Boffa, Conakry and Macenta where the public sector employers are the majority (Figure 30).

Figure 29: Distribution of the employers by activity sector



Source: Employers survey results (Guinea, 2014)

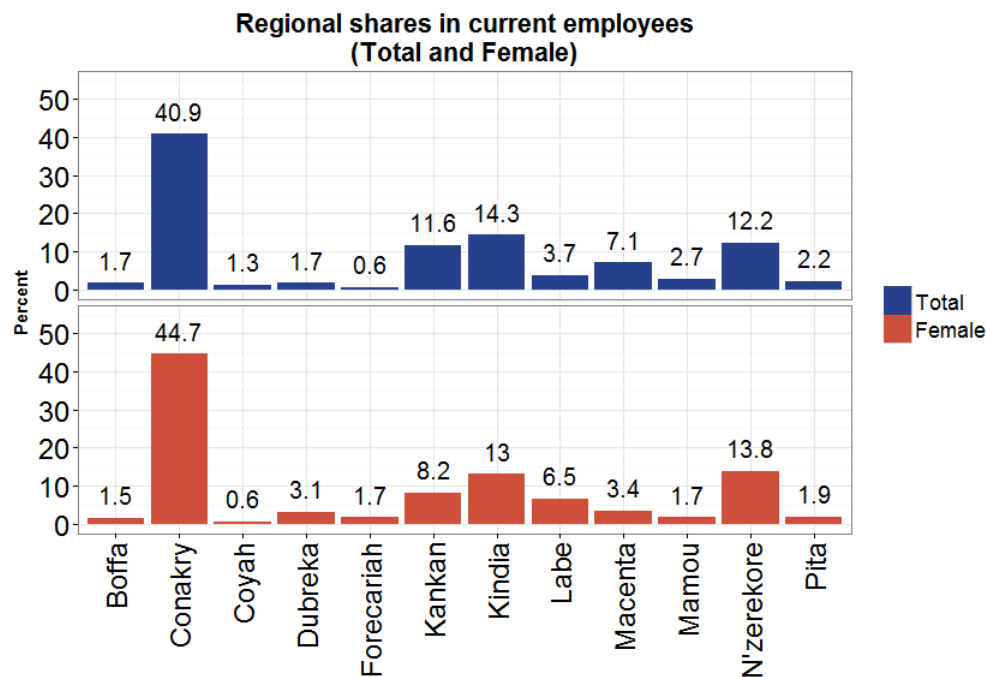
Figure 30: Distribution of the employers by activity sector and by region



Source: Employers survey results (Guinea, 2014)

In terms of regional distribution of the employees effective in the interviewed institutions, we find that it focuses on four areas: Conakry, Kankan, Kindia and N'zérékoré. All together, they represent 79% of employees of all kinds. The same is observed for employed women. Indeed, the same regions compress over 80% of the female employees contingent within the interviewed employers (Figure 31).

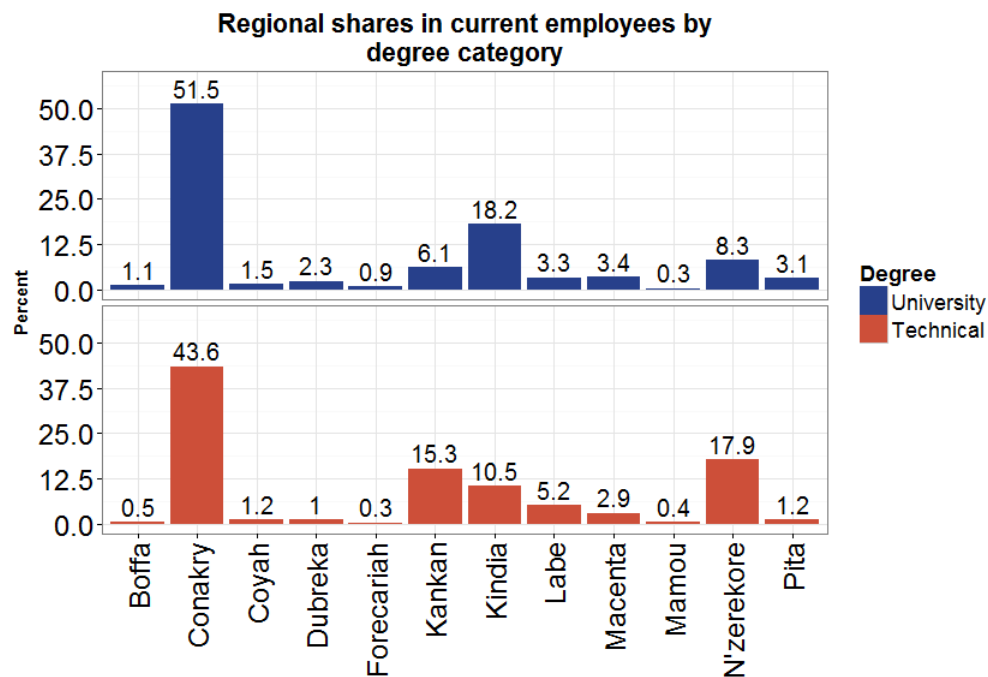
Figure 31: Regional share in the current employees contingent (Total and Females)



Source: Employers survey results (Guinea, 2014)

It is concluded that the regional distribution for employees who received university or technical training exhibits the same characteristics as the general population of employees. The latter is even more concentrated where we notice that the regions of Conakry, Kankan, Kindia and N'Zérékoré grant themselves 84% of the academic staff contingent and 87% of the technician employees contingent (Figure 32).

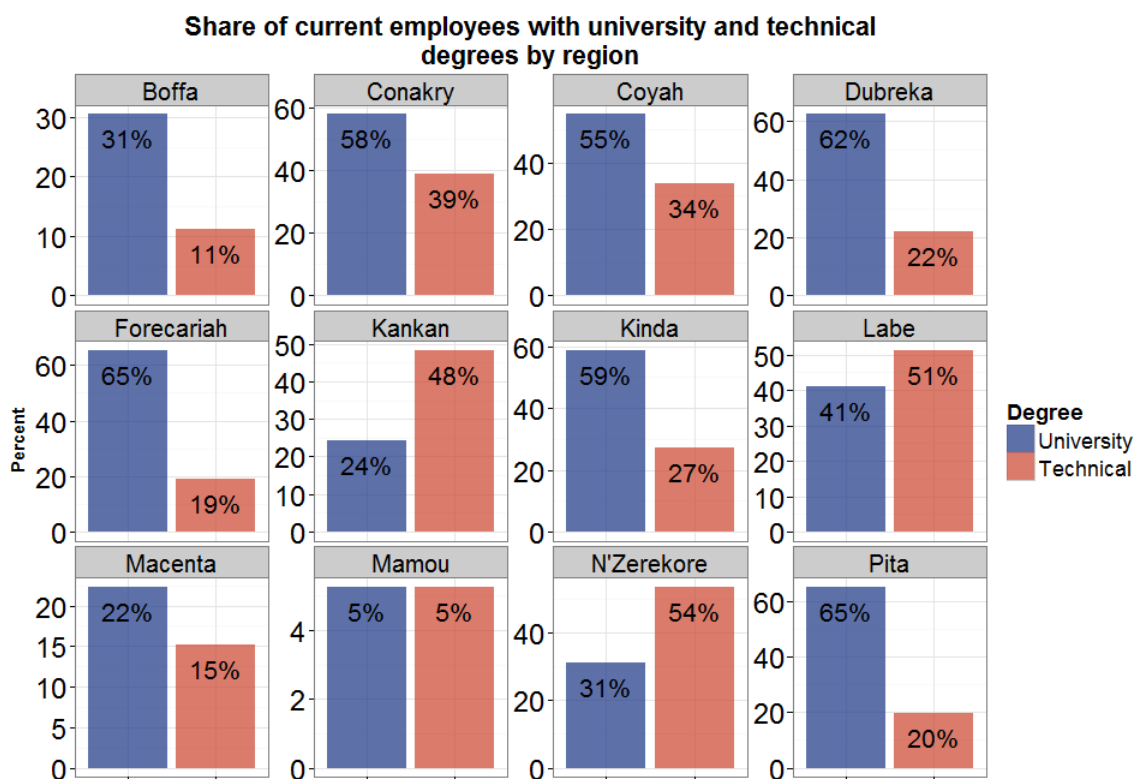
Figure 32: Regional share of the current university employees and technicians



Source: Employers survey results (Guinea, 2014)

In terms of the distribution of the employed academic staff and technicians, we find that they jointly represent the majority of the effectively employed in most regions. Indeed, the share of academics and technicians exceed 70% in the regions of Conakry (97%), Coyah (89%), Dubréka (84%), Forécariah (84%), Kankan (72%), Kindia (86 %), Labe (92%), N'zérékoré (85%) and Pita (85%). For Macenta and Mamou, the share of university employees and technicians does not exceed 40% and stand around 37% and 10% respectively; whereas at Boffa, the latter is slightly above the 40% threshold with academics and technicians representing 42% of the total employed (Figure 33).

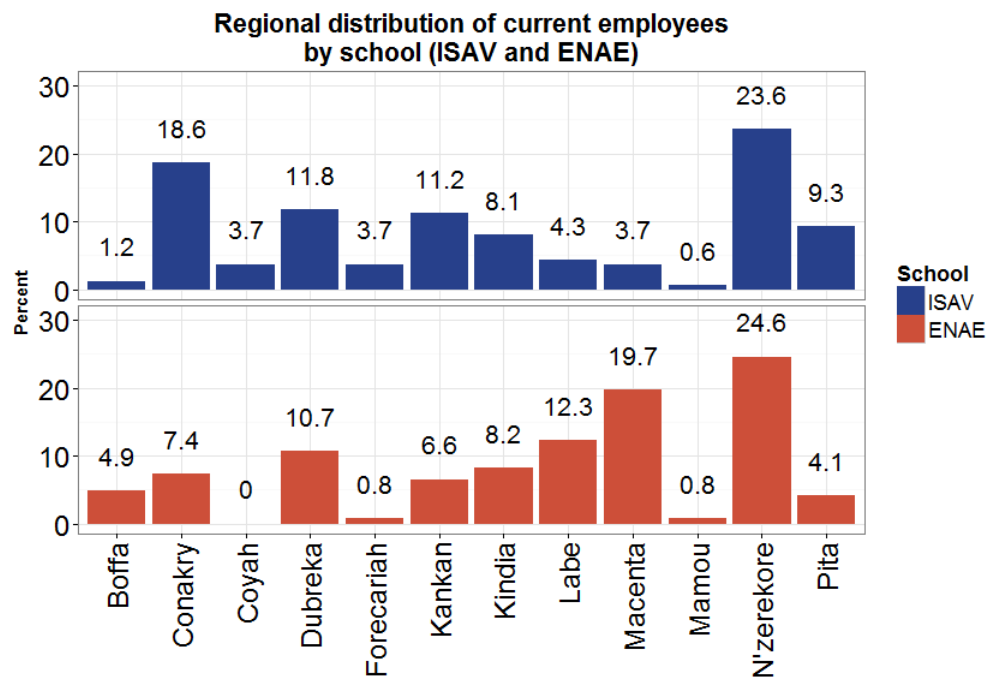
Figure 33: Share of the university employees and technicians in the general employee population by region



Source: Employers survey results (Guinea, 2014)

For the data relative to the current employees within the interviewed entities, and who come from ISAV and the ENAEs, we find that the regional distribution is less concentrated compared with the general population of employees (Figure 34). However, some regions exhibit a strong representation as is the case for N'zérékoré and Conakry which represent 24% and 19% of those with university degrees. For employees from the ENAEs, we find that the regions of N'zérékoré and Macenta represent 25% and 20% respectively of the current employees contingent.

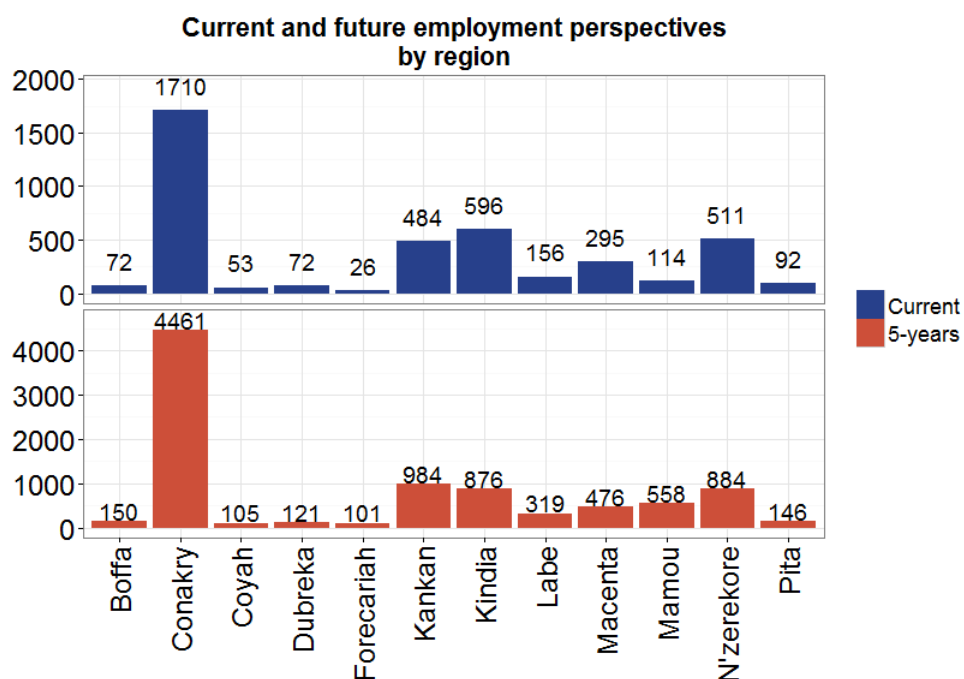
Figure 34: Regional share in current employee contingent from ISAV and the ENAEs



Source: Employers survey results (Guinea, 2014)

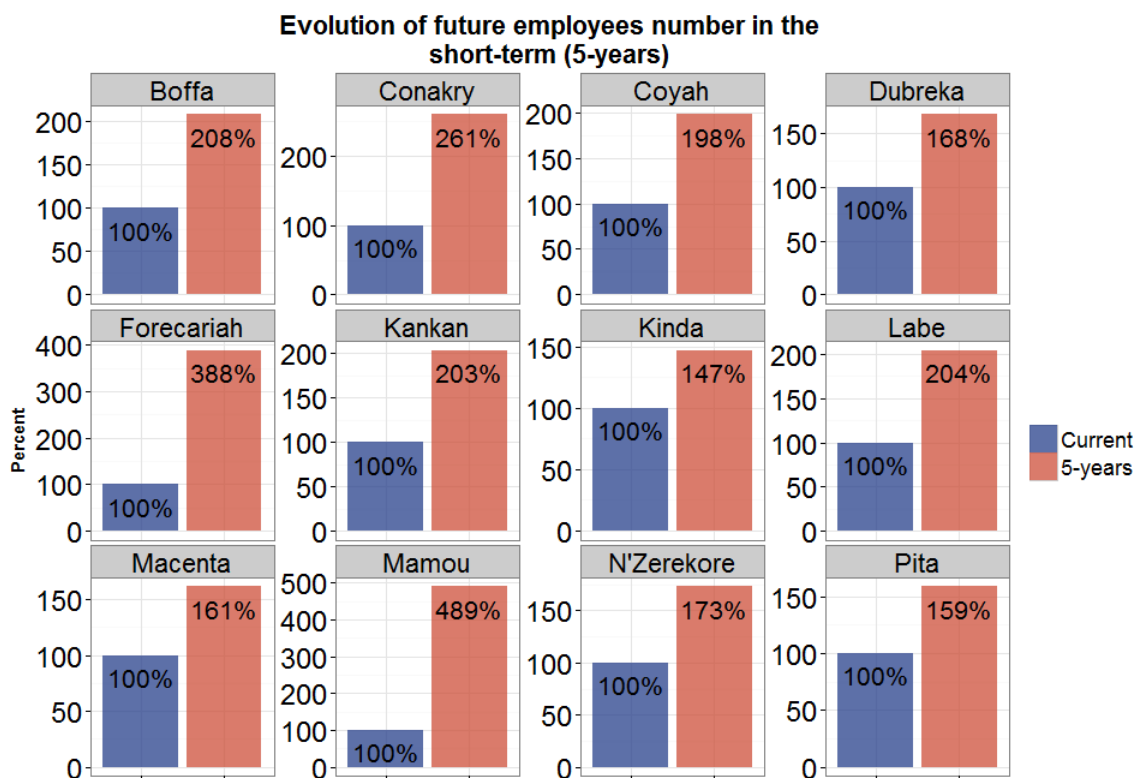
In terms of employment perspective in the short term, we conclude that the number of employees is projected to increase significantly in all regions. Indeed, some regions exhibit a rapid development in the employees effective within the next five years. For example, the number of employees in the areas of Mamou and Forécariah is projected to increase by 389% and 288%. The regions of Conakry, Boffa, Labé and Kankan follow with a staff increase of 161%, 108%, 104% and 103% respectively. The rest of the regions exhibit staff increases under the 100% threshold: 98% at Coyah, 73% at N'zérékoré, 68% at Dubréka, 61% at Macenta, 59% at Pita, and 47 at Kindia (Figures 35 and 36).

Figure 35: Evolution of the total employee number in the short term in absolute value



Source: Employers survey results (Guinea, 2014)

Figure 36: Evolution of the total employee number in the short term in percentage



Source: Employers survey results (Guinea, 2014)

4.2. Qualitative analysis

In this section, we conduct a qualitative descriptive analysis of responses drawn from the key informant surveys of employers. The objective is to shed light on thematic questions related to:

- employers' evaluation of graduates from ISAV and ENAE?
- ways to improve the partnership with the schools?
- types of on the job training offered by employers to current employees?
- how ISAV and the ENAE can participate in meeting the challenges of the rural sector in Guinea?

Through the answers of employers collected via the surveys, we observe that the most desired profiles are those of graduates with university and technical degrees. In particular, graduates from agricultural fields such as livestock, agricultural machinery, rural economics, etc. are highly sought after. In terms of skills, employers specifically expect of graduates a good mastery of the technical itineraries, good oral and written communication skills, and the predisposition to relocate to rural areas. Frequently, and given the heterogeneous nature of their field of work, employers require specific skills. For instance:

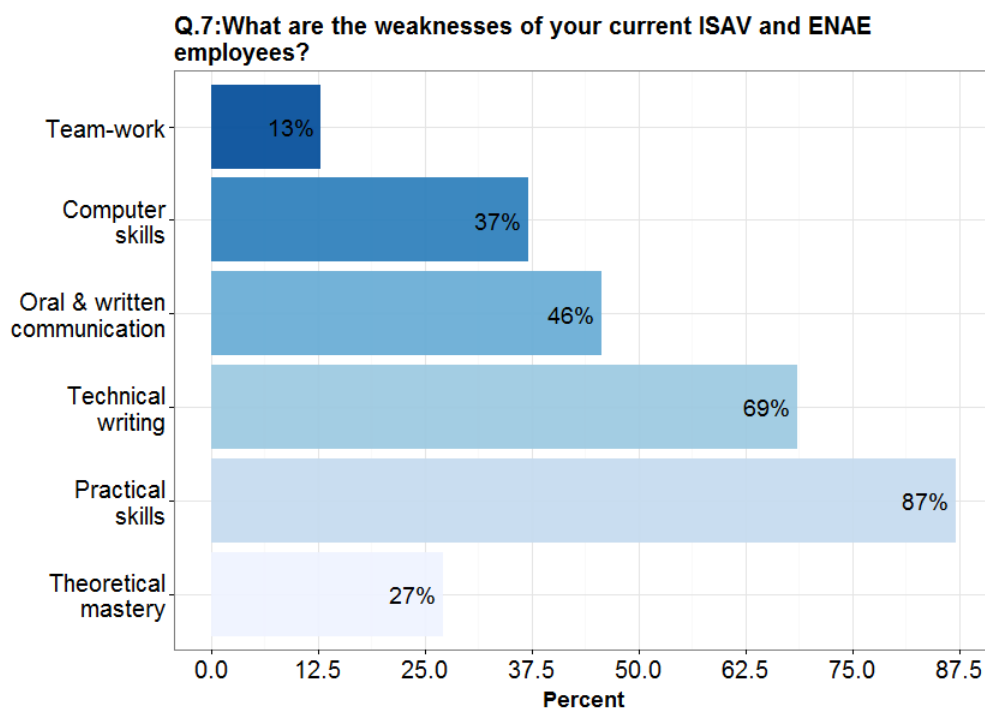
- a forestry organization requested: "we need the graduates to have more competency in reforestation, management of forest nurseries, mastery of legal texts and the laws governing the forestry sector";
- a poultry farmer complained that "in general, the graduates are characterized by a lack of mastery in terms of practical skills needed to manage operations such as beak trimming, installing colored contact lenses, vaccination, etc. It is sometimes the case that field workers have more experience and skills than the technicians";
- an NGO working in public health seeks potential employees "... to raise awareness and education about tuberculosis, latrine (or communal toilets) construction, construction of slabs for families in urban and rural communities, etc.";
- a company working in cotton production demanded that "graduates should be introduced during their crucial at the schools to cotton production, plant physiology, plant improvement in nutrition and plant protection."

For recruitment, the employers in general use similar methods based on the CV, internships certificates and reports, reference letters, and in certain cases an evaluation of the research themes developed by graduates. Additionally, a majority of employers use the opportunity of internships they provide to identify and select desired profiles.

Most employers have in place systems of performance evaluation for their employees. They are based mainly on evaluations of activity reports for the university trained personnel, the maintenance of observation reports for the technicians, and monitoring the completion of the tasks on the ground, etc. Nonetheless, the evaluation cycle varies among employers, and can range from weekly and/or monthly to trimester and/or yearly evaluations.

For the evaluation of the graduates from ISAV and the ENAE, the main conclusion that emerges from the analysis of the employers' surveys is the lack of practical knowledge and experience of graduates. According to our analysis, 87% of employers denounce the gaps in terms of mastery of the technical itineraries related to different modes of production at the farm level. A majority of employers mention also that they are unsatisfied with the graduates' skills level in terms of drafting technical and analytical reports (69%), oral and written communication (46%), and computer literacy (37%). In terms of theoretical mastery of their subject matter and team-work, 27% and 13% respectively of employers are unsatisfied with the graduates' current level (Figure 37). It is worth mentioning that with respect to comparing the graduates of ISAV and the ENAE, the analysis of employers' responses indicate that the graduates from ISAV are in general well versed theoretically, but lack practical experience on the field; and vice-versa for the graduates from the ENAE. Additionally, the ENAE graduates are appreciated by employers for their willingness to relocate to rural areas, whereas the ISAV graduates showcase a strong bias in favor of urban centers.

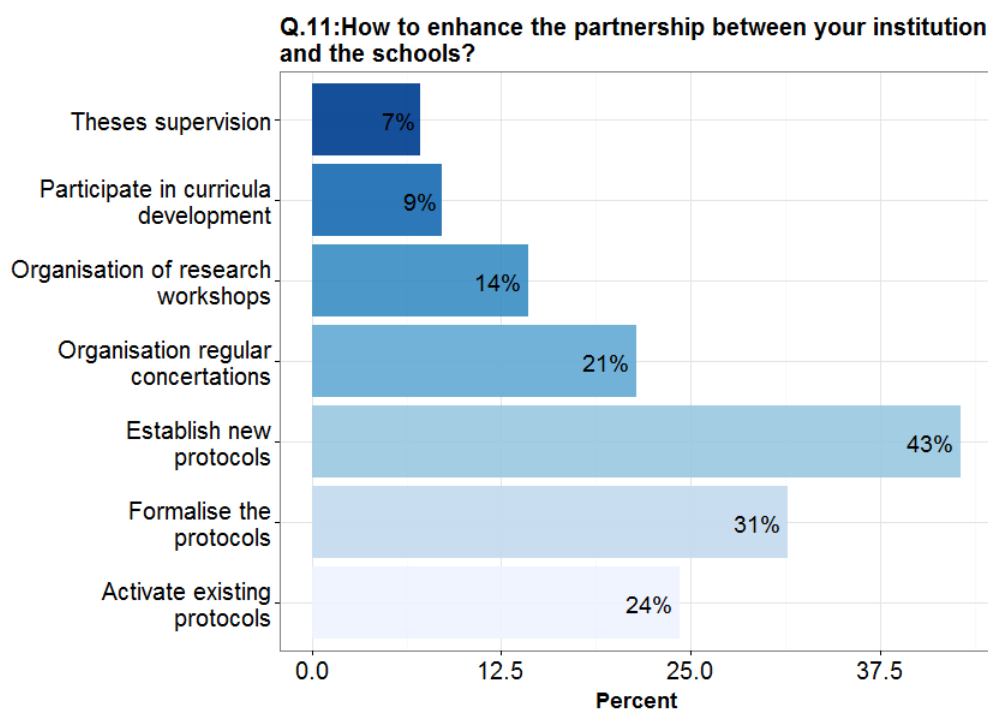
Figure 37: Skills level gaps of ISAV and ENAE graduates by category as identified by the employers



Source: Employers survey results (Guinea, 2014)

At the level of building partnerships with the schools (ISAV and the ENAE), the majority of employers denounce the lack of establishment of official conventions of collaboration. Indeed, 43% of employers have no official protocols of collaboration with the schools. Some employers mention the existence of signed conventions of collaboration, but which are rarely operational (24%) and/or non-official (31%). Additionally, employers complain of lack of organization of open-doors events in which employers can participate and engage with students looking for internships opportunities (21%), lack of research symposia and workshops (14%), lack of opportunities to collaborate on curricula and/or course development (9%), and lack of employers' representation and/or participation in defining students' research themes (7%) (Figure 38).

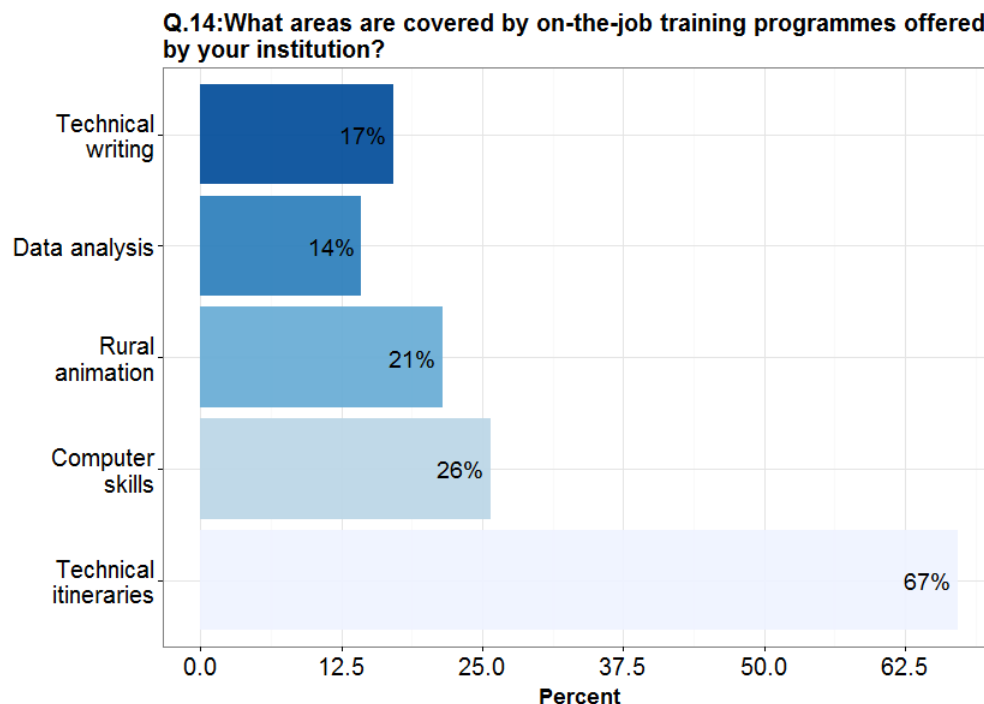
Figure 38: Analysis of employers' responses to the question of how to enhance partnerships with the schools



Source: Employers survey results (Guinea, 2014)

Given the gaps from which many graduates suffer upon joining the workforce, employers usually offer on the job training programs. The main objectives of the training programs are to enhance the mastery of technical itineraries in production at the farm level. Indeed, 67% of employers provide training on the latter as they often operate in very specific sectors (e.g. cotton, rice, etc.) and to which graduates had very little exposure during their studies at the schools. Other areas targeted by the training programs are computer skills (26%), rural animation (21%), data management and analytical skills (14%), and technical writing skills (17%). It is worth mentioning as well that a majority of employers denounce as well the weak mastery of French language usage.

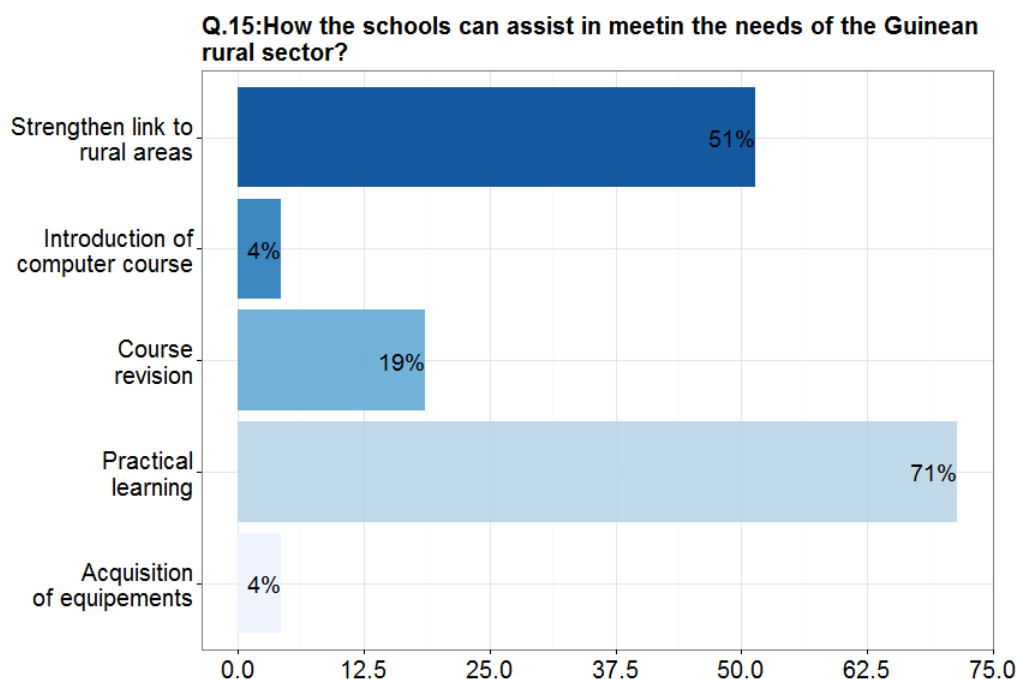
Figure 39: Analysis of employer responses concerning continuing education to graduates



Source: Employers survey results (Guinea, 2014)

In terms of recommendations to improve and enhance the performance of the schools' curricula, a majority of employers suggest a better integration between the theoretical and practical dimension of the curricula (71%), and with a special focus on the rural context (51%). Ameliorate course content in order to adapt them to the realities of the ground comes in third in terms of employers' suggestions (19%). Additionally, some employers mentioned the need to invest in experiment equipment (4%) and the introduction computer skills training (4%). For computer skills training, it includes as well other tools such as the GPS systems. Other employers, especially NGOs and construction firms with foreign partners and/or customers, suggest that the schools invest in creating English courses within their curricula. We note as well that a majority of employers denounce the recent reforms adopted within the higher education in Guinea and which amounted to the adoption of the LMD system. They advise to go back to the old system with the memoire, especially at the level of ISAV.

Figure 39: Analysis of employers' answers with respect to how schools can improve their curricula in the face of the needs of the rural sector in Guinea



Source: Employers survey results (Guinea, 2014)

5. Conclusions

The present study is based on the analysis of data collected through two sets of surveys targeting different stakeholders within the agricultural job market in Guinea. The first set of phone surveys, i.e. the phone surveys, was administered to graduates from the agricultural higher education institutions in Guinea, and which included: the ISAV at Faranah, the ENAE at Kankan, Macenta, Tolo, and Koba, and the ENATEF at Mamou. The second set of surveys, i.e. the key informant surveys, targeted the current and potential employers of graduates. We used descriptive statistics to analyze the data collected and draw our conclusions. Additionally, an econometric analysis was conducted based on the data from the phone survey data to determine the factors that affect the probability of employment for graduates.

The findings from the phone surveys suggest that the rate of employment for graduates in the formal sector reaches 34% for ISAV, 26% for ENATEF, and 13% for the ENAE. Within the ENAE, the rate of employment varies greatly and is as follows: 7% at ENAE-Tolo, 12% at ENAE-Macenta, 13% at ENAE-Koba, and 24% at ENAE-Kankan. Additionally, the survey data provides estimates of rate of employment in the informal sector for the technical schools and is

as follows: 9% at ENAE-Tolo, 5% at ENAE-Macenta, 1% at ENAE-Koba, and 3% at ENAE-Kankan.

When we take into account the employment sector, we observe that the private sector is the main provider of jobs for the graduates in the survey (Table 1). Indeed, 66% of graduates from ISAV in Faranah are employed in the private sector. This proportion reaches 65% for the graduates of ENATEF and 56% for the graduates of the ENAE. Within the ENAE, the share of graduates employed in the private sector can reach in the upward of 70% for the ENAE in Macenta. For the public sector and self-employment categories, we observe that there exist substantial variation. For instance, the share of graduates employed in the public sector varies from 0% in the ENAE in Tolo to 28% in the ENAE in Kankan and Koba. Self-employment is an important source of jobs for graduates, but with great variation across institutions. For instance, 11% of graduates of ENAE of Kankan are self-employed; whereas this proportion reaches 63% in the ENAE of Tolo. Nevertheless, it is worth mentioning that for the ENAE of Tolo, the high share of self-employed among the graduates is due to the fact that an important share of graduates uses the school's farm plots as a start-up for their agricultural business.

The female graduates represent 19% of the graduate pool included in the surveys who are currently employed. In general, the formal sector is the major purveyor of jobs for 24% of female graduates from ISAV, 30% from ENATEF and 11% from the ENAE. Within the ENAE, the rate of employment in the formal sectors varies across ENAE for female graduates as follows: 9% at ENAE-Tolo, 17% at ENAE-Koba and 20% at ENAE-Kankan. In addition, we note that 6% and 5% of female graduates from ENAE at Tolo and Kanken respectively are employed within the informal sector. We note however that for the ENAE-Macenta, none of the female graduates is currently employed in the formal and informal sectors. The main reason for this situation appears to be that 20 or the 23 of the Macenta women in the sample are from the 2013 cohort. The data indicates that for all the schools it often requires several years for graduates to find formal sector jobs. Consequently, it is not surprising that 2013 Macenta women graduates are unemployed.

At the sector level, we note that the private sector is the major employer of female graduates (Table 2). Nevertheless, the employment dynamic within the female pool of graduates offers substantial differences compared with the general population. For instance, female graduates rarely report self-employed status. The private sector employs 58% of female

graduates from ISAV, 73% from the ENAE, and 100% from ENATEF. Within the ENAEs, the share of female graduates employed in the private sector is as follows: 50% at ENAE-Kankan, 80% at ENAE-Koba, and 100% at ENAE-Tolo.

From the econometric analysis of the phone survey data, we find that ISAV graduates benefit from a higher employment probability in the formal sector than that of their fellows at the ENAEs and ENATEF. Indeed, the probability estimates suggest that being an ENAE graduate is associated with a decreased probability for formal employment of about 16% in comparison with an ISAV graduate. Personal characteristics can have a significant effect on the estimation results, as it was suggested by a number of discussed studies through a review of the economic literature. In our estimation, for example, the gender and competence level of graduates play an important role. It was estimated that being a male graduate is associated with an increase in the formal employment probability of about 7%. A high level of competence is associated with an increase in the formal employment probability of about 9%.

At the disaggregated models level, we find that for ISAV graduates, the graduate's gender, the specialization department field and competence levels play a significant role in determining the probability of being in formal employment. Indeed, our analysis suggests that being an ISAV male graduate is associated with an increase in the employment probability of the order of 13%. For the competence level, a unity gain is associated with an increased probability of employment by 25%. While at the level of training courses, we find that being an ISAV graduate in Water and Forests is associated with an increase in the probability of employment of about 17% compared to the graduates from the Agriculture department. However, the Agroforestry graduates exhibit a decrease in the employment probability by 20% in comparison with their fellows in the Agriculture department.

For the ENAEs and ENATEF graduates, only the training department exhibit a statistically significant effect on employment probabilities in the formal sector. Our results suggest that being an ENAE graduate in the Agriculture B program is associated with an increase in the employment probability of about 11% compared with the Agriculture A graduates. For the Water and Forests program whose graduates are entirely from ENATEF, we conclude that compared to the Agriculture A graduates in the ENAEs, the probability of formal employment increases on the order of 20%.

For the employers' survey interviews, the objective is to assess the need of expertise by the employers, and evaluate the strengths and weaknesses of the graduates. In terms of the projections for future hiring by the employers in the short (5 years), medium (10 years) and long (20 years) terms, the majority of employers expressed reservations in providing estimates. Nevertheless, after discussions with the employers, a majority agreed to provide estimates for potential hiring within the next five years. It follows from the results of the survey that the number of employees is projected to double. But, there exists substantial regional differentiation.

In terms of employees' profiles that are most desired by the employers, the majority expressed a desire to hire university graduates and technicians, and especially in areas related to livestock, agricultural machinery, rural economics, etc. Among the skills' most desired, a majority of employers express a special interest in graduates with strong mastery of technical itineraries, oral and written communication, and a willingness to deploy at the level of rural districts. Given the heterogeneous nature of the pool of current and potential employers, it emerges that employers frequently express a need for specific expertise in relation to their area of activity.

When evaluating the performance of graduates from ISAV and the ENAE, a common point over which the majority of employers agree is the lack of practical knowledge (87%). Additionally, many employers denounce the poor level of the graduates' writing skills (69%), oral and written communication skills (46%), and computer skills (37%). With respect to mastery of theory and team work, 27% and 13% respectively of employers express dissatisfaction. Nevertheless, there exists a major contrast between the graduates of ISAV and ENAE. Many employers report that in terms of mastery of theoretical knowledge, the ISAV graduates exhibit in general a superior level compared with the ENAE graduates; and vice-versa with respect to the practical knowledge where the ENAE graduates are thought to be superior to their peers from ISAV. Additionally, many employers deplore the fact that ISAV graduates are usually unwilling to relocate to rural areas; where the contrary is true for the ENAE graduates.

At the level of collaboration with the education schools, a majority of employers denounce the lack of official conventions and protocols of partnerships. Indeed, 43% of employers report not having any sort of convention with ISAV and the ENAE. Others mention the existence of such conventions and/or protocols, but with no-active implementation (24%), and/or informal (31%). Additionally, many employers denounce the lack of organizing symposia

and open-door events to inform students of internships and/or employment opportunities (21%), research workshops (14%), partnerships in terms of course preparation and teaching (9%), and consultation on research themes for student's theses (7%).

6. Recommendations for the agricultural higher education institutions

On the basis of the low level of professional insertion of graduates in the formal agricultural job market, future demand for expertise by employers, and the econometric analysis of the survey data, it is possible to propose a number of recommendations as follow:

- Enhance understanding and mastery of the agricultural technical itineraries. Given that employers demand specific expertise to their field of operation and the problems of budgets constraints, the most practical option is to focus on internships programs. Despite the availability of farm plots within the schools, they remain underequipped and obsolete in comparison with the technologies used by the employers in the private sector in Guinea. In this regard, internships ought to be longer with active supervision from the internships' supervisors.
- To close the gaps in terms of communication skills, there is need to incorporate more instruction in oral and written communication through intensification of written assignments and in-class presentations. In addition, written communication instruction ought to introduce the professional dimension through training in producing written reports similar to technical summary notes encountered on the job. Also, in-class presentations ought to be done in PowerPoint so as to enhance students' computer abilities.
- Add and enhance instruction in computer skills and technical equipment (e.g. GPS).
- Improve relations with the employers. Most employers wish to formalize relations with ISAV and the ENAE, with an active monitoring of tasks accomplished, through:
 - Participation of the employers in the supervision of the internship reports. Employers report a preference for actively participating in the decision of the research themes and be part of the defense committees;

- The students' advisors need to check on their students while on the field during the internships at least once in order to observe the conditions of work and discuss progress with employers;
 - To enhance the students' awareness of internships and help employers identify potential candidates for future hiring, the schools need to organize annual Job Fairs. These events are a primary source of on-campus networking for the employers and which facilitate meetings with faculty and students;
 - To facilitate contact with the employers, the schools could develop advisory councils under the auspices of the Guinean Agricultural Institutional Network (GAIN). The function of such councils is purely consultative. With a primary objective as the facilitation of the communication between the schools and the employers.
- In order to familiarize, encourage and facilitate the students' integration in the rural regions post-graduation, there is need to introduce regular field trips throughout the curriculum years in ISAV and ENAE. Ideally, these trips ought to cover all agricultural regions within Guinea.

In addition, students need to improve their level with respect to the English language. In certain domains and for particular jobs, English proficiency is a requirement. Introducing English into the schools' curricula can take many forms, each enhancing the other and building on their mutual strengths. For instance, instruction could be introduced as an extracurricular activity. Additionally, the encouragement from the part of the schools in organizing "English Clubs" or other students associations can enhance the students' ability to practice outside the classrooms.

Appendices

Appendix A: ISAV graduates questionnaire

A. First and last name: -----

B. Address: -----

C. Department name: -----

D. Graduation year: -----

E. Are you employed: Yes ----- No -----

a. If not, why? -----

b. If yes, in which sector? :Public-----, private-----, self-employment-----

• In which structure/company/organization? -----

• Job title: -----

• Job starting time: -----

F. How would you rate the quality of your education at ISAV/F?

1) Bad -----

2) Average -----

3) Good-----

4) Excellent -----

Justify your answer: -----

G. If you were to start a new training, would you return to ISAV/F? (Check response that apply)

1) Not at all -----

2) Probably not -----

3) Probably yes -----

4) Certainly yes -----

Justify your answer:-----

H. How did your training at ISAV contribute to enhance your knowledge and skills and your personal development in the following areas?

(Answers coding: 1: very little, 2: a little; 3: sufficiently, 4: a lot).

- a. Being able to express oneself clearly and correctly -----
- b. Having critical and analytical thinking -----
- c. Being able to get employment related to knowledge and competence -----
- d. Being able to work efficiently with others -----
- e. Being able to resolve real-life complex problems -----
- f. Being an active and informed citizen -----
- I. In which areas do you wish you had more training from ISAV/F? -----

J. Would you accept to help ISAV/F students gain new and/or more knowledge?

Yes ----- No -----

If yes, how would you proceed? -----

If not, why? -----

K. Do you have any suggestions or advice that could help ISAV/F improve the student's education? If yes, please specify below:

Date: ----- /-----/2013

Investigator: -----

Address: -----

Appendix B: ENAEs and ENATEF graduates questionnaire

- A. First last name: -----
B. Current Address: -----
C. School name and chosen option:-----
D. Graduation year:-----
E. Are you employed : Yes ----- No -----

a. If not, why? -----

b. If yes, in which sector? Informal-----Public-----Formal private-----self-employment-----

- In which structure/company/organization? -----
- Job title: -----
- Job starting time: -----

F. How would you rate the quality of your education at the technical school (ENAE or ENATEF)?

- 1) Bad -----
- 2) Average -----
- 3) Good-----
- 4) Excellent -----

Justify your answer: -----

If you had to advice someone about their training, would you direct that person towards you technical school? (Check response that apply)

- 1) Not at all -----
- 2) Probably not -----
- 3) Probably yes -----
- 4) Certainly yes -----

Justify your answer: -----

F. How did your training at the technical school contribute to enhance your knowledge and skills and your personal development in the following areas?

(Answers coding: 1: very little, 2: a little; 3: sufficiently, 4: a lot)

- a. Being able to express oneself clearly and correctly -----
- b. Having critical and analytical thinking -----
- c. Being able to get employment related to knowledge and competence -----
- d. Being able to work efficiently with others -----
- e. Being able to resolve real-life complex problems -----
- f. Being an active and informed citizen -----

H. In which areas do you wish you had more training from your school?

I. Would you accept to help students from the technical school gain new and/or more knowledge?

Yes ----- No -----

If yes, how would you proceed ?-----

If not, why? -----

J. What is your English proficiency level?

None-----

Beginner-----

Read and write well-----

Bilingual-----

K. Do you have any suggestions or advice that could help the school improve the student's education? If yes, please specify below:

L. -----

Date: ----- /-----/2014

Investigator: -----

Address: -----

Appendix C: Questions' guide for employers

Note:Each collaborator will use the Winrock attendance sheet to register Names and job titles of the interviewees:

Name of the company or organization:

Address

-
1. How many employees does your company or organization employ? Total :_____F :_____
 2. What is the approximate percentage of employees in each category of education below :
 - a. Elementary school_____
 - b. Middle school_____
 - c. High school_____
 - d. Technical diploma (ENAE, ENATEF)_____
 - e. University diploma (ISAV)_____
 3. What type of employee do you wish to hire? Or what are the criteria that you use to decide who you will hire?
 4. In your opinion, what indicators demonstrate that graduates are prepared to work for you?
 5. What type of evaluation do you use to determine if your employee is productive?
 6. What are the strengths of the graduates that you hire from each school?
 7. What are the weaknesses of the graduates that you hire from each school?
 8. How do you use IT technology in your company's activities?
 9. Do you use modern equipment and techniques in your company's activities?
If yes, which ones?

If not, are you planning on integrating them?
 10. In which field of agriculture would you like graduates to have more knowledge?

11. Have you had former students from the schools interning in your company/organization?

Yes _____ No _____

If yes, what are the benefits to your company in participating in internships programs?

12. What type of knowledge and agricultural skills do graduates need to have in order to work in your company/organization?

13. How can we improve the partnership between your company/organization and the schools?

14. How and to what extent are you satisfied with the knowledge of the school's graduates that you hire?

15. Approximately, how many employees will the company or organization have in:

5 years – Total : _____ F : _____

10 years – Total : _____ F : _____

20 years – Total : _____ F : _____

16. What will the percentage of education level be?

	5 years	10 years	20 years
a. Elementary school	_____	_____	_____
b. Middle school	_____	_____	_____
c. High school	_____	_____	_____
d. Technical diploma	_____	_____	_____
e. University diploma (ISAV)	_____	_____	_____

17. What additional training have you provided the graduates that you hired?

18. How can the schools better help satisfy the needs of the Guinean rural world in priority?

19. Do you have any other suggestions for the schools?

Appendix D: Chronology of tasks realised for the phone surveys of the ENAEs & ENATEF and the key informant surveys

Date	Tasks Realised
Sunday, July 20th, 2014	<ul style="list-style-type: none"> — Training of consultants at ENATEF on the Human Subjects Research Training — Modification of the ISAV phone survey to implement it for the ENAE and ENATEF (Appendix B) — Modification of the key informant survey for employers (Appendix C) — Discussion of the introductory script for the phone survey and the key informant survey — Discussion of methodology of data collection on the field - data will be entered in an excel database to be sent to Dr. Lowenberg-DeBoer by email — Meeting with the representatives of the ENAE and ENATEF to discuss the procedure for the phone survey implementation
Monday, July 21st, 2014	<ul style="list-style-type: none"> — Dr. Lowenberg-DeBoer and the two consultants traveled to ENAE at Tolo about 30 km north of Mamou. The director general, Youla Yamoussa, was not present, but the team was aided by Amadou Kanté, ENAE Tolo Director of Studies. Mr. Kanté provided the team with the names and phone numbers of 113 of the 142 graduates in the last five years. This was in spite of the fact that director general told Dr. Lowenberg-DeBoer in March that ENAE Tolo did not even have a list of graduates
Tuesday, July 22nd, 2014	<ul style="list-style-type: none"> — The team, under the supervision of Dr. Lowenberg-DeBoer, conducted a key informant interview with employers in Mamou and which included: the Union of Agricultural Groups in Soumbalako and the Prefectural Union of Breeders
Wednesday, July 23rd, 2014	<ul style="list-style-type: none"> — The team, under the supervision of Dr. Lowenberg-DeBoer, conducted a key informant interview with employers including: the Peasants Federation of Fouta Djallon in Timbi Mahdina and the Regional Institute of Agronomic Research of Middle Guinea in Bareng

Date	Tasks Realised
Thursday, July 24th, 2014	<ul style="list-style-type: none"> — Dr. Lowenberg-DeBoer and the two consultants went to ENAE-Tolo in order to launch the phone survey — Selection of 10 students and interns to administer the phone survey after completing a training session covering: <ul style="list-style-type: none"> ○ The Human Subjects Research Training ○ A discussion of the questions of the phone survey ○ The introduction script — A simulation test was conducted on how to administer the survey — Prepaid phone cards were distributed to cover phone calls cost
Friday, July 25th, 2014	<ul style="list-style-type: none"> — Drafting of the survey reports, arrangement of notes, etc.
Saturday, July 26th, 2014	<ul style="list-style-type: none"> — Trip by Alseny and Diawo to Macenta and Dr. Lowenberg-DeBoer to Conakry and then back to the US
Sunday, July 27th, 2014	<ul style="list-style-type: none"> — Launching the phone survey at ENAE at Macenta — 17 assistants and volunteers (13 students and 4 staff from the Direction of the ENAE) benefitted from the same training that the two consultants went through and which included: <ul style="list-style-type: none"> ○ The Human Subjects Research Training ○ A discussion of the questions of the phone survey ○ The introduction script — A simulation test was conducted on how to administer the survey — Prepaid phone cards were distributed to cover phone calls cost
Monday, July 28th, 2014	<ul style="list-style-type: none"> — Ramadan break
Tuesday, July 29th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the Regional Center of Agronomic Research for Guinea Forestry at Sérédou and the Swine and Poultry Farm Orphelinat at Ormaï (Macenta)
Wednesday, July 30th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the National Federation of Coffee and Cocoa Planters at Macenta, ANPROCA at Macenta and the Prefectoral Direction of Livestock at Macenta
Thursday, July 31st, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the Prefectoral Unit of Water and Forestry at Macenta — Data entry of the collected answers
Friday, August 1st, 2014	<ul style="list-style-type: none"> — The two consultants Alseny and Diawo traveled to N'Zérékoré, and meeting the regional unit of the OP of Guinea Forestry to identify potential employers

Date	Tasks Realised
Saturday, August 2nd, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: FIDA at N'Zérékoré — Continuation of search for phone contacts and scheduling of meetings with the different potential employers in N'Zérékoré
Sunday, August 3rd, 2014	<ul style="list-style-type: none"> — Drafting reports by the consultants Alseny et Diawo; — Continuation of search for phone contacts and scheduling of meetings with the different potential employers in N'Zérékoré
Monday, August 4th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the Prefectoral Direction of Breeders at N'Zérékoré and the Regional Representation of the CNOPG of Guinea Forestry
Tuesday, August 5th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: <ul style="list-style-type: none"> ○ FEREPPAH-GF (Regional Federation of Palm Oil and Natural Rubber Producers of Guinea Forest Zone) ○ FEPRORI-GF (Federation of Rice Producers of Guinea Forest Zone) ○ Private clinic YAH DOATO at N'Zérékoré, and ○ NGO AUDER (United for Rural Development)
Wednesday, August 6th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: <ul style="list-style-type: none"> ○ The Institute of Research and Extension of Grass Cutter Breeding of Guinea at Moata ○ Project ACORH (GRET/MGE) ○ The poultry farm TALL
Thursday, August 7th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the Forestry Center of N'Zérékoré, NGO AAPRGF (Association of the Development Specialists for Rice and Pork Production in the Guinea Forest Zone)
Friday, August 8th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the MANICO-TP company, the NGO OCPH-CARTTAS (Catholic Organization for Promotion of Humanity)
Saturday, August 9th, 2014	<ul style="list-style-type: none"> — The consultants Alseny et Diawo travel to Kankan
Sunday, August 10th, 2014	<ul style="list-style-type: none"> — Drafting of the reports by the consultants Alseny and Diawo — Continuation of search for phone contacts and scheduling of meetings with the different potential employers in Kankan

Date	Tasks Realised
Monday, August 11th, 2014	<ul style="list-style-type: none"> — Launching the phone survey at ENAE Bordo (Kankan) — 17 assistants and volunteers (11 students and 6 staff from the Direction of the ENAE) benefitted from the same training that the two consultants went through and which included: <ul style="list-style-type: none"> ○ The Human Subjects Research Training ○ A discussion of the questions of the phone survey ○ The introduction script — A simulation test was conducted on how to administer the survey — Prepaid phone cards were distributed to cover phone calls cost
Tuesday, August 12th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the Regional Center of Agronomic Research of Bordo - Kankan (CRRAB-Kankan) and the Regional ANPROCA at Kankan
Wednesday, August 13th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the Prefectoral Direction of Breeders at Kankan, the Federation of Cooperative Unions of Producers of Yam and Sesame (FUCPIS) at Kankan, and the veterinary clinic Batè at Kankan
Thursday, August 14th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the Cotton Project of Kankan, the Regional Representation of the CNOPG at Kankan, and FUMA-HG (the Federation of Vegetables and Fruits of High Guinea)
Friday, August 15th, 2014	<ul style="list-style-type: none"> — Drafting of the reports by the consultants Alseny and Diawo and confirmation of meetings for Saturday, August 16th
Saturday, August 16th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the Center for Research and Extension of Cane Rat Breeding at Kankan and the FUPRORIZ-HG (the Federation of Rice Producers of High Guinea)
Sunday, August 17th, 2014	<ul style="list-style-type: none"> — The consultants Alseny and Diawo travel to Labé (via Mamou)
Monday, August 18th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the NGO AVGRN (the Association of Volunteers for the Management of Natural Resources) at Labé and the NGO VDD (Volunteers for Sustainable Development) at de Labé
Tuesday, August 19th, 2014	<ul style="list-style-type: none"> — Conducting key informant interviews by the two consultants Alseny and Diawo and which included: FAPI-Guinea (the

Date	Tasks Realised
	Federation of Beekeepers of Guinea) at Labé, the NGO UGVD (Guinean Union of Volunteers for Development) at Labé and the NGO ECODEV (Exchange and Co-development)
Wednesday, August 20th, 2014	— Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the veterinary cabinet "Place in the Forest" at Labé; the Prefectoral Unit of Water and Forestry at Labé and the NGO Ballal Guinea at Labé
Thursday, August 21st, 2014	— The consultants Alseny and Diawo travel to Kindia
Friday, August 22nd, 2014	— Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the regional ANPROCA at Kindia, the Regional Center for Agronomic Research in Maritime Guinea at Foulaya (Kindia) and the NGO RGTA-DI (Guinean Network for Animal Traction and Integrated Development) at Kindia
Saturday, August 23rd-Sunday, August 24th, 2014	— Drafting of the reports by the consultants Alseny and Diawo — Continuation of search for phone contacts and scheduling of meetings with the different potential employers in Kindia
Monday, August 25th, 2014	— Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the NGO APEK Agriculture (Association for the Economic Promotion of Kindia) — Continuation of drafting of the reports
Tuesday, August 26th, 2014	— Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the NGO SARA (Support Structure for Networking of Women Farmers and Farmers), the BRPR service (Regional Bureau of Rural Roads), the BTGR service (Technical Bureau of Rural Engineering) of Kindia and the FABIK (Agro-Biological Farm of Kondoya)
Wednesday, August 27th, 2014	— The consultant Alseny travels to Boffa (via Dubréka) — The consultant Diawo travels from Kindia to Boffa via Conakry — Interview the employer FOB-BG (Federation of Peasants Organizations of Lower Guinea) by the consultant Alseny
Thursday, August 28th, 2014	— Launching the phone survey at ENAE Koba (Boffa); — 17 assistants and volunteers (11 students and 6 staff from the Direction of the ENAE) benefitted from the same training that the two consultants went through and which included: <ul style="list-style-type: none"> ○ the Human Subjects Research Training ○ a discussion of the questions of the phone survey

Date	Tasks Realised
	<ul style="list-style-type: none"> ○ The introduction script — A simulation test was conducted on how to administer the survey — Prepaid phone cards were distributed to cover phone calls cost — Interview the employer: Station of Agronomic Research of Koba (Boffa) by the consultants
Friday, August 29th, 2014	— Interview of the employer: Rice Seed Center at Koba (Boffa) by the consultants
Saturday, August 30th, 2014	— Interview of the employer: the Chinese Poultry Farm and Hatchery Siguicoda at Koba (Boffa) by the consultants
Sunday, August 31st, 2014	<ul style="list-style-type: none"> — Closing of the phone survey at ENAE Boffa — Drafting the reports and departure of Diawo to Conakry
Monday, September 1st, 2014	<ul style="list-style-type: none"> — The consultant Alseny travels from Koba to Boffa Center — Interview of the employer: the French NGO CMC (Charente Maritime Cooperation) — The consultant Alseny travels from Boffa Center to Dubréka
Tuesday, September 2nd, 2014	<ul style="list-style-type: none"> — Interview of the employer: the NGO ADAM of Dubréka by the consultant Alseny Soumah — Drafting of the reports of interview by Alseny — Data entry of the survey forms of the ENAE Boffa by Diawo — The consultant Alseny travels back to Conakry
Wednesday, September 3rd, 2014	<ul style="list-style-type: none"> — Continuation of data entry of key informant survey by Alseny — Continuation of data entry of the survey forms of the ENAE Boffa by Diawo
Monday, September 8th, 2014	<ul style="list-style-type: none"> — Data entry of the investigation reports — Negotiation of meeting schedule with the Cabinet Nimba at Kagbélen (Dubréka) with the assistance of the ANAVIG (National Association Poultry Breeders and Producers of Guinea) by Alseny — Schedule meeting with the CNOPG, the National Direction of Water and Forestry and the National Direction of Veterinary Services of the Ministry of Livestock by Diawo
Tuesday, September 9th, 2014	— Interview of the employer: Livestock Cabinet "NIMBA" by Alseny
Wednesday, September 10th, 2014	— Conducting key informant interviews by the two consultants Alseny and Diawo and which included: the CNOPG at Conakry, the National Direction of Water and Forestry of the Ministry of Environment at Conakry

Date	Tasks Realised
	— Schedule meeting with the National Direction of Rural Engineering of the Ministry of Agriculture
Thursday, September 11th, 2014	— Interview of the employer: the National Direction of Veterinary Services of the Ministry of Livestock by Alseny at Conakry
Friday, September 12th, 2014	— Interview of the employer: the National Direction of Rural Engineering of the Ministry of Agriculture by Alseny at Conakry
Monday, September 15th, 2014	— Interview of employers in the Forécariah prefecture by the consultant Alseny Soumah including: the NGO ADMR (Association for Development in Rural Areas); the NGO AVOD (Association of Volunteers for Development); the NGO ASDD (Association for Solidarity and Sustainable Development) and the ETCO company (Earth Moving and Construction Company)
Tuesday, September 16th, 2014	— Meeting with the National Directors of ANPROCA and the IRAG of the Ministry of Agriculture at Conakry by the consultant Alseny for the scheduling of meetings
Wednesday, September 17th, 2014	— Meeting with the National Direction of Livestock Production and Industry of the Ministry of Livestock by the consultant Alseny to schedule meeting
Thursday, September 18th, 2014	— Interview of employers from the prefecture of Coyah by the consultant Alseny Soumah including: the ANPROCA of Coyah prefecture and a private company, Lasira Construction at Coyah
Friday, September 19th, 2014	— Meeting with the National Direction of the company GUICOPRESS by the consultant Alseny Soumah at Conakry
Monday, September 22nd, 2014	— Interview of the employer: the National Direction of Livestock Production and Industry at the Ministry of Livestock by the consultant Alseny Soumah at Conakry
Tuesday, September 23rd, 2014	— Meeting with the National Direction of Rural Roads and the ANPROCA of the Ministry of Agriculture by the consultant Alseny Soumah
Wednesday, September 24th, 2014	— Interview of the employers: the National Direction of Vocational and Technical Training and the National Directorate of Vocational Education Post Primary and Secondary of the Ministry of Technical Education by Alseny Soumah at Conakry
Thursday, September 25th, 2014	— Working session at Winrock offices at Conakry — Discussion with Andrew of the mission order with the meeting with the Ministry of Higher Education

Date	Tasks Realised
	— Summary of activities and tasks for Dr. Lowenberg-DeBoer, etc.
Friday, September 26th, 2014	— Meeting with the IRAG by Alseny for the interview, but the meeting was adjourned due to health issues of Dr. Mamadi Kourouma phone : 622 27 13 00/655 76 43 02 (Chief of personnel at IRAG)
Saturday, September 27th-Tuesday, September 30th, 2014	— Data entry of the key informant survey results by Alseny and sending to Dr. Lowenberg-DeBoer
Wednesday, October 1st, 2014	— Interview of the employer: the mining company Rio Tinto Simfer by the consultant Alseny at Conakry
Thursday, October 2nd-Friday, October 10th, 2014	— Data entry of the rest of the reports by Alseny and sending to Dr. Lowenberg-DeBoer

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